THE ROLE OF CHILD AND ADULT IN THE CREATION OF MOTHERESE: A STUDY OF SPEECH TO FIRST- AND SECOND-LANGUAGE LEARNERS.

by

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TO MY SON

AMIR

DECLARATION

I declare that this thesis is my own unaided work.

Amal I.E. Kary

ABSTRACT

This longitudinal study is specifically designed to test the fine-tuning hypothesis which proposes that it is the language ability of the listener which governs the syntactic and rhetorical profile of his linguistic experience. It also tests a new 'functional' hypothesis, formulated as a result of findings from this research, which argues that sundry features of this profile are dependent upon the function of the speaker's discourse rather than on the nature of the addressee.

In order to isolate the otherwise (and previously) confounded variables of age and language ability, a new experimental design is used which matches native first-language learners with non-native second-language learners of similar ages but of different language abilities. A further control is introduced by having the same adult interact with both members of the same age-pair. Specifically, each of three pairs of 2-, 3- and 5-year-old children, in which one pair member is a Scottish first-language English learner and the other an Arabic second-language English learner, is tape-recorded with its respective teacher at 4-week intervals over a 5 to 7 month period.

Although analyses of adult-to-child speech for the six learners individually support the description in the literature of motherese features (that is, a difference between adult-to-adult and adult-to-child speech), comparisons of the adult-to-native and adult-to-foreigner speech within and across the three age-pairs, do

not show that motherese is governed by the linguistic needs of the child. Consequently, the fine-tuning hypothesis is not substantiated.

This failure to account for the motherese phenomenon and the presence in the literature of unexplained results has led to the formulation of the new functional hypothesis. The design of this study allows for investigation of this theory, and an analysis is made of speech segments directed to the same listener but displaying different speech functions.

The results of this second investigation demonstrate that the variable of speech function is indeed the potential cause of certain characteristics of motherese.

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CHAPTER ONE - The Rationale

This study is specifically designed to investigate the role of the linguistic abilities of the child addressee in shaping the characteristics of his linguistic experience. It isolates the otherwise (and previously) confounded variables of the addressee -- age and his language proficiency -- by employing an experimental design which matches children of similar ages, but of different linguistic sophistication. It is, therefore, a direct test on the fine-tuning theory which proposes that the language abilities of the listener control the nature of speech directed to him.. Levelt (1975) explains the conceptual framework of the theory in which the adult furnishes the child with:

> An intelligent text presentation: the child is presented with grammatical strings from a miniature language which is systematically expanded as the child's competence grows (p.15).

According to this position, the adult must gear his speech to the verbal capabilities of the child but must also gradually modulate its features over time in accordance with the child's developing sophistication. Failure to perceive the child's linguistic level or failure to accommodate the child's progressing needs 'systematically' would result in 'grammatical strings from a miniature language' too easy or too difficult to support the process of acquisition.

However, evidence for the fine-tuning theory remains circumstantial. Many researchers (Snow, 1972; Gleason, 1973;

Vorster, 1975; Cross, 1977; Furrow et al. 1979 and Rondal, 1980, among others) argue that adults 'tailor' their speech to fine stages in the child's development in order to prevent the child from 'tuning out' of complex linguistic patterns (see Shipley, Smith and Gleitman, 1969). That results continue to be equivocal is largely due to the difficulty of devising experiments which could isolate the factors that shape input to the child. Previous research has posited that the addressee himself elicits a specific input. Comparisons between speech to children and speech to adults have identified the characteristics of child-directed speech or 'motherese'. Cross-sectional studies of input at different ages have suggested that there were correlations between the age of the addressee and speech directed to him. However, age-related changes in adults' usage are not necessarily geared to linguistic changes as the theory predicts. Children simultaneously develop physically, mentally, socially and verbally. Sheer height, comprehension signals, tactile ability, social skills, mental development or finally language growth could be controlling the child's experience which has been attributed merely to an age factor in previous studies. In other words, concomitant with the age of the addressee are a host of variables which preclude the isolation of the single linguistic factor to which adult's speech is adjusted and, in turn, a direct test of the fine-tuning hypothesis is not possible. Therefore, a study which isolates this crucial factor is absolutely required and long overdue.

Newport, Gleitman and Gleitman (1977) point to another complicating aspect of age in the study of cause and effect in

language acquisition. The authors draw attention to the fact that simple correlations between input and age of the child do not entitle researchers to conclude -- as some do -- that input causes child language growth. The younger the child, the more different his input will be from the adult's; but the younger the child (up to a point), the faster his language growth. Unless the age of the child is somehow removed from the picture, there will always be simple correlations between input to the child, his age and rate of his linguistic development.

This intricate three-way relationship of parental input, rate of linguistic development and child's age does not lend itself to simple causative interpretations. Newport et al. solved this problem by using double partial correlations to remove the effect of their subjects' age and language knowledge on their mothers' input and on their own development rate. The effect of this procedure was to equalize all children to an identical age and language skill at the first interview. What was left to study was the residual variance of the motherese characteristics and the child's growth rates. With only one sampling point, Harkness (1977) also performed statistical manipulation to obtain fine-tuning correlations. Harkness correlated motherese characteristics with child's mlu while removing the child's age by partialling out techniques. However, Cohen and Cohen (1975) recommend against the use of partialling out procedures in studies with highly intercorrelated variables. The intricate three-way relationship is one such net of interrelations of parental input with child's age, child's age with linguistic skill, linguistic skill with rate of language growth and finally

rate of growth with age and parental input.

In order to remove the effect of age, other workers employed other techniques. Furrow, Nelson and Benedict (1979) chose an experimental design to investigate the effect of adult speech on child's progress. From a large data base, they selected children of the same age and the same language abilities and computed simple correlations between aspects of mothers' speech at the start of the study and their children's language growth after nine months. Wells (in press) followed a similar method. On the other hand, Cross (1978) matched children of different ages, but with similar language proficiency and then attempted to partial out age from her design. Age of the addressee is, therefore, a variable which requires special manipulation.

While this study does not address the cause and effect issue in language acquisition per se, it tackles it from an alternative perspective. To posit that the child's environment is necessary or facilitative to the acquisition process, the variables which cause that environment need to be discovered. If the linguistic stages of the addressee shape the nature of his experience - as predicted by the fine-tuning position - then we have clear evidence of the role of input in contributing to or supporting the acquisition task. The experiment in this study specifically isolated the linguistic sophistication of children from their other developmental attributes by using a matched-age-pair design. The experimental method matched native with non-native English-speaking children of similar ages, but of different language abilities. The rationale behind this

selection was that foreign children would be less proficient in English than their English-speaking native controls. As adults have been known to adjust their speech to foreigners (Ferguson, 1971, 1975), adult speech to the linguistically more naive child of the pair (i.e. the foreigner) should be the less complex input - if the fine-tuning hypothesis is correct. The individual style of the speaker was also controlled by having the same adult speaking to the matched-age-pair.

The design employed in this thesis secured, therefore, a direct test on the fine-tuning hypothesis. In some respects, the technique falls between the statistical solution of Harkness and Newport et al. and the experimental manipulation of Cross and Furrow et al. The matched-age-pair design removed the effect of age from the picture and left the linguistic stages of the addressees as the independent variable potentially causing changes in child-directed speech. Age was controlled for rather than language proficiency which was the variable controlled by Cross. The study also combined aspects of cross-sectional and longitudinal research by employing monthly recordings of speech addressed to one age-matched pair in each of three age groups: two- three- and five-year-olds. However, the study has identified another factor more dramatically responsible for the characteristics of input than the linguistic stages of the addressees. It proposes and tests a functional hypothesis which argues that sundry features of the child's linguistic experience are dependent upon the purposes of the speaker rather than the nature of the listener.

The work described below tests a number of specific hypotheses. In order to understand their rationale, it is necessary to outline the conceptual framework of the bulk of research in the field. The primary interest in describing the structure of input to language learners has been in the light it may shed on the process of language acquisition. The impetus of such research came originally from the assumptions upon which Chomsky (1965) based his arguments. Chomsky's claims and their contemporary climate of opinions are the source of the hypotheses to which this study addresses itself.

To argue for the explanatory adequacy of a generative grammar and to provide a theory of language acquisition consistent with linguistic theory, Chomsky (1965) contended that both the linguist and the child learning a language are faced with the same problem. Both have to determine from actual behaviour the underlying system of rules that has been mastered by the speaker-hearer of a language and both succeed in constructing an adequate grammar. However, both encounter deviant speech models characterized by 'numerous false starts, deviation from rules, changes of plan in mid-course and so on' (p.4), all of which make their task almost impossible. Whereas the linguist can have recourse to his own linguistic intuitions about the grammatical correctness of the language he is describing, the child will have no such recourse unless he is already a native speaker of the language he has yet to acquire. Chomsky maintained the following:

> [In view of] the degenerate quality and narrowly limited extent of the available data, the striking uniformity of the resulting grammars, and their independence of intelligence, motivation and

> emotional state [there is] little hope that much of the structure of the language can be learned by an organism initially uninformed as to its general character (p.58).

Not only first language acquirers, but also children acquiring a second language must, by this logic, suffer a sort of linguistic deprivation. The deprivation is due to the inadequacy of the primary linguistic data as a model for abstracting the rules of the language as well as the overall indifference of that data to the needs of an initially uninformed organism. And Chomsky makes just such a statement:

> It seems clear that many children acquire first or second languages quite successfully, even though no special care is taken to teach them and no special attention is given to their progress. It also seems apparent that much of the actual speech observed consists of fragments and deviant expressions of a variety of sorts. Thus it seems that a child must have the ability to 'invent' a generative grammar that defines well-formedness and assigns interpretations to sentences even though the primary linguistic data that he uses as a basis for this act of theory construction may, from the point of view of the theory he constructs, be deficient in various respects (p.200-1).

In this view, a grasp of general linguistic principles is innate and the attention of research should be directed to the structure rather than the provenance of such an ability.

But in these passages, Chomsky makes several strong claims more by way of assumptions than of conclusions from well-founded evidence. These are:

a) that adult language is so degenerate that neither the child nor the linguist can depend upon it in

constructing a model of language.

b) that children acquire first and second languages with no special teaching or attention to their progress.

c) that the child has the same intentions and descriptive problems as the linguist.

d) that all children produce strikingly uniform grammars.

e) that all children acquire language irrespective of intelligence, exposure, motivation or emotional state.

These bold statements ran directly counter to the existing behaviourist and social learning theories. According to these theories (Skinner, 1957; Miller and Dollard, 1941) the origin of language acquisition was in the environment of the learner, shaping his verbal behaviour by reinforcement and assisting him with models of language to imitate. Moreover, notes on special forms of adult speech to children predated Chomsky's innatist assumptions and suggested that adults had always paid some sort of attention to the child's acquisition. There were many remarks on special lexis used to children recorded in the anthropological literature (Chamberlain, 1890; Sapir, 1929; Casagrande, 1948; Voegelin and Robinett, 1954 and Austerlitz, 1956). Linguists, too, had attempted to reflect on the

nature of such words. Jespersen (1922) had suggested that the presence of special word-forms in speech to children represented attempts made by the adults to accommodate features of the child phonology. Jakobson (1960) had remarked that the words parents used to their children seemed to reflect the simplest phonological units a child can manage (such words predominantly contained nasals and stops and lacked consonant clusters). Ferguson (1956, 1964) had collected attestations of baby-talk words in the speech of adults from different cultures which indicated some phonological simplification of forms addressed to children. Finally, psychologists had proposed that adults appeal to a criterion of utility in selecting what name shall be used for an object in naming it to their children (Brown, 1958). Brown and Bellugi (1964) had also identified the presence of potentially didactic sequences in the speech of mothers to their children.

In short, then, the existing records had always indicated that adults exhibited a particular linguistic treatment of the verbal environment of the child. As for the nature of adult speech to other adults, there was one paper available (Maclay and Osgood, 1959) which reported the false starts, slips of the tongue and grammatical mistakes of, not surprisingly, linguists at a conference. In other words, there was no compelling evidence to support Chomsky's characterization of speech to children. However, there was no research which seriously challenged his assumptions (`a' to `e' stated above) and there was virtually no description beyond the word level of the exact nature of input to children.

Subsequent research into the issues raised by Chomsky threw doubts on his pronouncements. The view that children acquire language 'independently of intelligence, motivation and emotional state' seems only to be a convenient Chomskyan composition. Research into extreme cases of early linguistic deprivation such as the wild boy of Aveyron (Lane, 1975) and Genie (Curtiss, 1977) suggest that in the absence of motivation and emotional security, normal language development is almost impossible. In less extreme cases where emotional stability was available but motivation was not, as with Jim -- a hearing child of deaf parents -- acquisition did not successfully take place. At age 3, Jim, whose only contact with language had been through television and playmates, had a limited vocabulary and his language was far behind children of his age. Jim improved rapidly when his contact with language was broadened (Sachs and Johnson, 1976).

Chomsky's argument about the uniformity of grammar acquisition also remains an assumption. Hymes (1971) argued that 'language competence' and the 'acquisition of grammars' are inadequate accounts of what it means to acquire a language. According to Hymes, the acquisition of language involves the acquisition of 'communicative competence' whereby the child acquires the rule-governed language use in the context of social interaction (also, Donaldson, 1978; Gleason and Weintraub, 1978). Moreover, as Bard (1980) remarks, research into children's language has revealed both striking uniformity (Brown, 1973) and striking lack of uniformity (Schaerlackens, 1973a) in grammar production. Bloom's (1970) study also casts doubt on the assumed innately preprogrammed

ability of all children to acquire a single grammar.

Another claim which seems only to suit Chomsky's arguments concerns the degeneracy of adult speech to act as a model to the linguist. Labov (1970) reported that performance data, that is the use of grammatical rules in verbal communication, is not as deviant as it had been assumed. Labov writes that:

> The ungrammaticality of everyday speech appears to be a myth with no basis in actual fact. In the various grammatical studies that we have conducted, the great majority of utterances - about 75% - are well formed sentences by any criterion. When rules of ellipsis are applied and certain universal editing rules to take care of stammering and false starts, the proportion of truly ungrammatical and ill-formed sentences falls to less than 2% (p.42).

Finally, the major Chomskyan assumption concerning the irrelevance of the child's experience in language acquisition is examined in detail during the course of this thesis. A new group of studies set out to seek empirical evidence for the role of the environment in learning first and second languages. Obviously, the description of learners' linguistic input became central and was considered, quite rightly, to provide insight into the nature of the acquisition process. The reasoning held was that a child's mind was similar to a 'black box' which can be understood by comparing input to it with output from it. In other words, the degree to which input is structured determines - albeit negatively - the role and degree of innate structures the child may be credited with. Fodor (1966) clearly explains the rationale:

> If the linguistic information in the child's data

> closely approximates the linguistic information he must master, we may assume that the role of intrinsic structure is relatively insignificant. Conversely, if the linguistic information at which the child arrives is only indirectly and abstractly related to the data provided by the child's exposure to adult speech, we shall have to suppose that the child's intrinsic structure is correspondingly complex (p.107).

Research into first language input discovered that speech to children is nothing like a randomly selected corpus of adult utterances 'full of disconnected phrases and other deviations from idealized competence' as Chomsky (1972) would have us believe (also Chomsky, 1965; Fodor, 1966 and McNeill, 1970). This discovery formed the basis of a new hypothesis about the relevance of input to the acquisition process. Influenced by the dominant syntactic climate of opinions in language acquisition, a number of researchers have argued that the features which distinguish child-directed speech from adult language are 'admirably designed as a set of language lessons' (Snow, 1972). The differences in adult speech to children were supposed - on no independent evidence - to approximate the linguistic information the child must master, to serve as 'tutorial devices' in syntactic structures and therefore to act as linguistic models to children acquiring language.

Directly motivated by Chomsky's hypothesis about the minimal role of input in acquisition, a new position - the fine-tuning hypothesis - was formulated which allocated a maximal role to the child's linguistic environment. It argued that, in comparison to adult speech, the significant differences in input to the child are listener-dependent ones. That is, they are organized around the child's linguistic needs and most importantly change in a

'systematic' manner to accommodate his language growth. Indeed, some researchers proposed that not only the linguistic stages of the addressee control the nature of his input, but that adults can respond to very fine variations in their listeners' output (e.g. De Paulo and Bonvillian (1978) suggest that adults can `gauge' their style to the presence or absence of the possessive inflections in the child's language). In many respects, then, the fine-tuning hypothesis contradicts Chomskyan statements about the indifferent linguistic experience of the child. Research has been growing to establish the following:

i. That the linguistic environment of the unsophisticated listener is not just adult language; it is a significantly different style of speech from that used between adults.

ii. That the linguistic environment presents a model which is not degenerate from the point of view of rule abstraction; rather, that the learner's input is necessary or facilitates the acquisition task.

iii. First and second language learning children acquire language because special care is given to teaching them. Adults provide changing and graded models of language to cater for children's stages of linguistic development. Adults lead the way in the acquisition process, remain only 'one step ahead' of their listeners and therefore can boost their progress by simple and graded language examplars.

Over time, speech to children gradually develops into speech to adults.

The majority of input studies dealt with first language acquisition while research into the environment of second language learning has been slow in responding to Chomsky's claims. Ferguson (1971, 1975) identified the presence of ' a register of simplified speech' used in talking to foreigners which he called 'foreigner-talk'. He pointed out that in some ways it is analogous to talk to young children ('baby-talk'). Brown (1977) argued that speech to children and speech to foreigners share devices of a communicative component ('COMM') which aim at clarifying and simplifying speech for the sake of the linguistically unsophisticated listener. Yet unlike 'foreigner-talk', speech to children also includes features of an affective component ('AFF') shared by speech to lovers and pets which represents an expressive dimension of adult language. Although the subject of comparatively recent investigation, direct research in this area suggests that Chomsky's claims concerning input to second language acquirers were again not precise. Teachers talking to second language learners seem to produce modulations -- similar to those produced to first language learners -- in order to accommodate the linguistic naivety of their listeners. Nevertheless, the fine-tuning hypothesis has not been directly tested.

It is worth noting that while the fine-tuning position explains the nature of child-directed speech in terms of simplified structures, other workers cast doubt on this view (Newport, 1976;

Shatz and Gelman, 1977 and Newport et al., 1977). Newport et al. argued that in many respects speech to children contains characteristic structures which are psycholinguistically more complex than those typical of speech to adults. Together with Shatz and Gelman, the authors concluded that the difference between adult and child speech does not arise from a syntax-teaching purpose, but is rather a by-product of conversation with a linguistically and cognitively immature listener. Newport et al.'s 'multi-factor hypothesis' challenges the fine-tuning position. It states that because speech to children is motivated by a multiplicity of purposes, it is not finely adjusted on any level of description. This lack of adjustment would yield moderate to low or random results especially on the syntactic level in correlational studies of fine tuning.

This thesis focuses on the conundrum presented by the nature of input to the linguistically naive listeners and the factors controlling their experience. Chapter Two reviews the characteristics which yield significant differences in comparisons of speech to children and to adults and summarizes the arguments for their assumed syntax-teaching value. The discussion concentrates on the evidence which is required to support a fine-tuning hypothesis but which is still lacking. It also points to the presence of other factors at play in most of the previously published studies. Chapter Two also reviews the evidence that might lend support to a fine-tuning position from research into the linguistic environment of second language learners.

Chapter Three describes the experimental design of the present study and discusses the measures and procedures employed.

Chapter Four presents a first account of the results. The findings, on the whole, do not support the proposal that child-directed speech is finely-tuned, despite the fact that the study was specifically designed to maximize the opportunity of observing purely linguistic tuning.

Chapter Five reassesses the phenomenon of child-directed speech which has been referred to as motherese. It proposes and tests a functional hypothesis which argues that sundry features of motherese are predominantly governed by the conversational purpose of the speaker. It explains how the results of previous research are better understood within a functional view and, therefore, how both the child and the adult played a role in creating the motherese phenomenon.

Finally, Chapter Six draws conclusions from this work. It shows how the functional hypothesis might explain conflicting and confusing results of changes in linguistic input which are more frequently found to correlate with the child's age than with linguistic sophistication. It suggests that this new hypothesis opens better vistas for the relevance of input to acquisition than previously proposed hypotheses made available.

CHAPTER TWO - The Literature

I. Introduction

As most research into the child's environment has concentrated on recordings of mother-child dyads, speech to children has been christened 'motherese'. The name is sometimes used interchangeably with 'baby-talk' with the added difficulty that the two forms do not necessarily include the same linguistic characteristics. Moreover, motherese implies one type of parent speaker whereas baby-talk introduces an ambiguity by referring to both the speech of the mother and that of the child. In this thesis, baby-talk is confined to Ferguson's (1964) use of the term to describe particular lexical items. The term 'motherese' will be used according to current practice in the literature to describe characteristics of speech modulations to children irrespective of the mother speaker. More broadly, Adult/Child speech (abbreviated A/C) refers to adult speech to child(ren) and Adult/Adult speech (abbreviated A/A) refers to adult speech to other adult(s).

This chapter consists of 5 sections which organize the investigations into the nature of speech directed to linguistically naive listeners. Section II reviews the statistically significant differences between A/A and A/C which have been assumed to arise as a response to the addressee and to serve a tutorial function. The discussion will, however, point to conflicting results and interpretations which do not support the standard view that A/C features are listener-dependent ones as postulated by the

fine-tuning theory. Section II argues that the unpredictable variations in the results may well be due to the methodology applied or to unmonitored extraneous factors all of which make the current research imperative. Section III reviews factors other than the child-mother dyad which may influence the emergence of motherese, such as socio-economic and cultural variables as well as the sex and role of the speaker.

Section IV focuses on input research in second language learning which indirectly parallels the hypothesis of listener-related adjustments in first language studies. Section V reviews the recent attempts to find either a cause and effect relation between input and the child's progress in language, or a direct correlation between the linguistic stages of the addressee and the level of motherese directed to him. However, the discussion will point to the difficulty of forming predictions due to conflicting results and interpretations within and across studies, as well as to the difficulty of designing experiments which isolate the linguistic abilities of the addressee, the variable under study. The section ultimately discloses the rationale of the present research. Section VI gleans the predictions developed from theoretical and empirical perspectives which will be used in this thesis to test the fine-tuning theory.

II. Adult Speech to Children

In order to test the hypothesis that A/C is not just A/A, it is important to find statistically significant differences between the

two types of speech relative to the nature of the addressee - child versus adult. The methodology which has been used has involved obtaining speech samples of mothers talking to their children and comparing such samples with the speech of those mothers talking to another adult, usually the investigator. Such comparisons set an A/A baseline against which the degree and direction of differences, which are due to a change in addressee, were established. The dependent variables chosen for comparing A/C and A/A constituted both a descriptive framework of the input and an assessment of the syntactic and psycholinguistic complexity of speech addressed to the two types of listeners. The hypothesis was tested in the form of specific sub-hypotheses related to physical, syntactical and discoursal parameters, because it is assumed that these represent sources of complexity; their adjustment to the listener's linguistic abilities would therefore contribute to a reduction of the acquisition burden.

The discrepancies with the theory recorded identify the gap in the field which the current research attempts to fill by investigating the factors controlling the motherese phenomenon. The sections below summarize the parameters of the three levels of description where significant A/C and A/A differences have been reported[1]. The discussion points to the presence of large variability within and across results which should not have occurred had the age or the linguistic stage of the child addressee been the controlling factor of A/C and A/A differences, as argued by the fine-tuning theory. The review suggests that inconsistent and variable results may be due to the methodology employed in

calculating the parameters, or to the presence of factors other than the child addressee.

II. 1. Physical Features

The findings under this description argue that A/C reduces possible sources of complexity found in A/A by highlighting the acoustic characteristics of utterances, emphasizing their physical boundaries and generally rendering A/C more attention-capturing than A/A. However, not all workers agree on such an interpretation, nor do all results support it.

II. 1. a. Pitch

Two studies substantiate impressionistic reports (Ferguson, 1964; Drach, 1969; Gleason, 1973, Sachs et al., 1976) that A/C has a higher pitch than A/A. Remick (1971) asked eight Caucasian middle-class mothers to record at home 20 minutes of their usual talk with their children who ranged in age from 16 to 30 months. The mothers were subsequently recorded in the laboratory talking to the investigator about their home sessions. Spectographic analysis run on mothers' utterances showed that the fundamental frequency values (Fo) of mothers' speech were consistently higher to their children than to the adult. Moreover, mothers of the younger children had a greater range of frequencies than in A/A samples.

Garnica (1974, 1977), refining Remick's procedures, investigated the prosodic behaviour of 12 mothers to their

2-year-olds and 12 others to their 5-year-olds. Each group of adult speakers performed 3 verbal tasks (telling a story about a series of pictures, reading a short descriptive passage and giving instructions on how to solve a puzzle) in 2 sessions, once with the experimenter and once with their own children. Garnica found a significant difference between the mean Fo of A/A and A/C to the 2-year-olds (197.6 Hz versus 267.3 Hz $p<.01$) whereas there was no significant difference for the older children (202.8 Hz versus 206.4 $p>.05$).

Sachs (1977) reports that studies of infant pitch discrimination suggest that high frequencies of 500 and 2000 Hz are favourable orientating responses, whereas low frequencies of 250 and 1000 Hz are not. She argues that children would perceptually prefer a high range of frequencies (500 Hz is suggested), which is the range found in adult speech to them, and thereby suggests that adults match the perceptual biases of their listeners.

While a high pitch is often quoted by researchers and reviewers as an important feature contributing to the intelligibility of A/C, not all workers agree with this interpretation. De Paulo and Bonvillian (1978) point out that while a high pitch cues the child to attend to certain utterances, it may have a negative effect on the child insofar as he may learn to disregard low-pitch A/A which contains linguistic information. Bard (1980) argues that `a high Fo is likely to decrease intelligibility, because the higher the Fo the more widely spaced the harmonics will be, and the less information the whole set of harmonics will provide about the

formants of speech sounds' (p.13).

Garnica reports that pitch range is greater and more significant for A/C than A/A. According to her, this feature serves the social function of setting certain speech apart as peculiarly aimed at a certain listener, as well as the analytic function of facilitating the child's analysis of linguistic input. Bard observes that such variation in pitch-range may compensate for the loss of intelligibility caused by Fo.

II. 1. b. Intonation

Most researchers note that A/C has an exaggerated sing-song intonation contour which may substantiate Garnica's idea of a social function. Garnica reports that 25% of the sentences addressed to 2-year-olds had a rising final pitch terminal and, in comparison to A/A, the difference is significant. However, for the 5-year-olds, the incidence of rising terminal was occasional and the difference from A/A not significant. This result is not exactly what a linguistic stage hypothesis would lead us to expect. Moreover, Garnica's results suggest an effect for the task in producing sentential intonation. Most of the sentences with rising pitch terminal (85%) occurred during the puzzle task and were in the imperative form. It is possible, then, that the high Fo in Garnica's samples is related to the preponderance of rising pitch terminals associated primarily with the nature of the task and only secondarily with the child. (Fo difference was significant only for the 2-year-olds who received more rising terminals (25%) than the

5-year-olds (9%).)

However, there are some perplexing observations as well. Garnica's imperative sentences were made into rising intonation questions whereas Sachs et al. (1976) reported that they classified their simple declarative sentences as interrogatives because they were rendered with final rising intonation. If raised pitch terminals are associated with sentences which, in grammatical form, are imperatives or declaratives (and usually receive falling terminals), then the adult's use of such a device must be for purposes other than introducing the syntactic and prosodic features of the language. Although such devices may be perceptually salient for the child, they may equally confuse a listener who might sort out structures in terms of their intonation contours.

II. 1. c. Whispering

As adults seem to operate at the high end of the voice spectrum producing a high Fo and range, they frequently swing to the opposite extreme range by whispering. Garnica reports that the whispered segments or syllables were most often contained in the last half of the sentences and were significantly present in the samples addressed to the 2-year-olds, but absent from speech addressed to 5-year-olds and adults. She points out that both high-pitched and whispered syllables represent a perceptually salient input to the child.

II. 1. d. Rate of Speech

This supra-segmental feature has frequently been quoted as a very important adjustment in motherese which accommodates the perceptual limitations of the addressee. A low rate of speech does indeed contribute to the child's ease of syntactical processing. Few words per minute provide the child with more processing time per word on average, thus making his task easier. Moreover, a slow rate reduces the chances of semantic and syntactic overloading of input. Finally, a low rate of speech is associated with a slow and articulated input which contributes to a higher degree of intelligibility than a hurried flow of speech.

However, the results do not replicate each other and suggest that rate of speech, as measured by workers in the field, is influenced by variables other than the age or the linguistic ability of the child, contary to the fine-tuning theory. There seem to be two factors which can greatly bias results, one extrinsic to the discourse and another intrinsic to it. The extrinsic factor concerns the type of event around which the talk takes place; if it is not interrupted by other speakers or other activities, more words can be delivered, suggesting a fast rate of speech. The intrinsic factor concerns the time occupied by the interlocutor before taking up his turn; that is, the 'dead time' or pause between one speaker and another, and/or the actual speaking time of the interlocutor (see amendments followed in this thesis in Chapter III VI.A). In fact, many of the results seem to exhibit the interplay of both factors rather than an adaptation in a direct attention to the time taken to speak a syllable or to the child's linguistic and psycholinguistic limitations.

Remick's (1971) data is potentially the most realistic since mothers themselves taped their own behaviour at home. She reports, without inferential statistics, that mothers averaged 34.3 to 67.8 words per minute (hereafter w/m) in speech to their children, but 99.6 to 140.5 w/m to the investigator. The fluctuation in mothers' rate to their children is quite large and could be due to the wide age range of the subjects. Nevertheless, Remick's figures, at face value, reflect the fact that less speech is produced for children than for adults, and thereby suggest that mothers reduce the language processing task of their children by speaking more slowly. Remick's research is rigorous throughout and her figures are convincing, but other researchers have not been able to duplicate her results.

Broen's results, disregarding her interpretation, do not support the fine-tuning theory which assumes stage-related adjustments to the listener. Broen (1972) recorded the speech of 10 mothers whose younger children were between 18 and 26 months (mean age 21 months) and whose older ones were between 45 and 94 months (mean age 60 months). Each mother was taped with each of her 2 children in free play and telling a story based on pictures, and later she chatted to the investigator. In free play, mothers produced 69.2 w/m to the younger children and 86.2 w/m to the older ones. In storytelling, mothers increased their speech rates significantly to 115.1 w/m for the younger children and 127.5 words for the older ones. If the limited perceptual abilities of the listeners and their widely different linguistic stages were indeed the primary factor in controlling mothers' speech rates as the

theory requires, we should have obtained the following set of results in Broen's data:

> i. a large mean difference in w/m between the large mean age difference of the two groups within the same condition in either free play or storytelling.

OR

> ii. a large mean word difference between the 2 age groups in the same speech condition, but a small word difference between the 2 speech conditions.

What we obtain from a simple subtraction of means in her results (calculated by the writer) is just the opposite of what is expected in a listener-dependent hypothesis:

> i. a small mean word difference of 17 words in free play and an even smaller one, 12.4 words, in storytelling, whereas the mean age difference between the 2 age groups is 39 months.

AND

> ii. a large mean difference of 45.9 words between free play and storytelling in the younger group which is almost three times (2.7) as much as the difference between the young and old groups in the same condition of free play. Similarly, a large mean difference of 41.3 words from one speech condition to another in the older group which is slightly over three times the difference between the 2 ages within the same task.

It follows, then, that it is not easy to argue, as Broen does, that the rate of w/m varies according to the child's age, since that same child receives a greater number of words in another mode of discourse. It is indeed difficult to argue that changes in speech rates are caused by changes in the listener's age or language sophistication, since much larger changes occur for other tasks performed with the same addressee. The results demonstrate that the extrinsic discourse factor (event talked about) effects remarkable speech rate changes.

Moreover, Broen's finding for the A/A and A/C difference seems to be the result of incorrect comparison and is another example of the role of the extrinsic discourse factor. Broen compared the rates of mothers' speech to the experimenter with those of their speech to the older children in the free-play task. She argued that the selection of A/C baseline in free play is comparable to a baseline of adults talking to each other. Mothers averaged 132 w/m in A/A, significantly more than in A/C in free play. However, had Broen computed the difference test on the truly comparable A/C baseline, the results would have been dramatically different. Unlike free play with children, an adult type of conversation does not suffer many interruptions from the interlocutor and is similar to a storytelling session with children. Indeed, A/C in storytelling to older children was 127.5 w/m. Had Broen used the comparable A/C speech task of storytelling with A/A rate of 132.4 w/m the difference would obviously have been minimal (exactly 4.9 words).

A comparison between Broen's and Remick's results demonstrates the effect of the intrinsic factor of discourse on speech rates. Though Broen's youngest subjects (age range between 18 and 26 months) are comparable to Remick's subjects (16 to 22 months), Broen's result for free play (69.7 w/m) is twice the rate of Remick's (34.3 w/m). Given that Broen controlled for the task in her study and that her subjects' behaviour was significantly affected by it, Remick's results seem exaggerated. It is likely that the silences or pauses while the mother waited for a response from her child or the mother's own alacrity in negotiating and

taking up a turn in the relaxed setting of her home may have caused a depressed rate of speech in Remick's study; a depression probably caused by the intrinsic discourse factor[2].

So far it has been suggested that factors extrinsic and intrinsic to the discourse, when included in the computation of rate of speech, produce great fluctuation in results. Nevertheless, even if the age of the child addressee rather than the finer nuances of his linguistic abilities had a role to play in adaptations of speech rates, we would still expect the variation of adults' speech across studies to be within a restricted range. However, this is not the case. Adults' response across studies of similar addressee age do not reproduce even a restricted range. Indeed, in collating results for rate of speech, there is the double difficulty of deciding firstly which study has reasonable results, and secondly, discovering which study corroborates those results.

The controls exerted in Broen's study qualify her findings as the most reliable ones. They are in the main endorsed by Cross, but are not confirmed by either Sachs et al. or Ringler. Cross (1977) recorded 16 middle-class Australian mothers with their 19-to-33-month-old children who were developing language at a rapid speed. While Cross does not have an A/A baseline to establish that A/C is in any way different from the normal rate of speech of these mothers, her result is comparable to that of Broen (74.9 w/m and 69.2 w/m respectively in free play).

Although Sachs, Brown and Salerno's study (1976) deals with 5

non-parents' speech to a 22-month-old girl, their data is quoted here to demonstrate the wide range of variability discussed above. Sachs et al. requested 5 adult subjects to tell a story based on 2 pictures provided, once to the investigator and once to the young child (a task very similar to Broen's storytelling). Rate of speech was measured for the first minute of the sample. The mean of A/C was 132.0 w/m and 169.6 w/m for A/A. While the difference in Sachs et al.'s study is significant at the 5% level, their mean for A/C does not resemble Broen's for the young or even the old group (Broen's 115.1 and 127.5 w/m respectively in storytelling). More disturbing is the fact that Sachs et al.'s subjects produced to the child a rate of speech nearly identical to the adult-to-adult speech rate in Broen's study (132.0 w/m in Sachs et al.'s and 132.4 w/m in Broen's). Such divergent results can hardly support the argument for a uniform response among adults controlled by the age or even the presence of a child. Neither do these results suggest that there is a rate which will make speech optimally processable for 2-year-olds. It seems that some children receive exactly the same rate of speech as that occurring between some adults.

Another example of variability and diverging results comes from Ringler. In a longitudinal study of the effect of mother-infant care practices in a Cleveland hospital, Ringler (1973) recorded 10 Black American mothers with their children at 12 and 24 months during the break from hospital examination. The baseline of A/A was obtained from responses to a questionnaire in a formal interview of the mother by the experimenter. Results show that children at 12 months heard 14.2 w/m whereas the rate for A/A was significantly

higher at 53.6 w/m. A year later, those children, then 24 months old, heard an increased rate averaging 50.0 words, while their mothers talking to the investigator also produced an increased rate of 72.9 w/m. Although Ringler's average for the 2 sessions is 33.9 w/m and approximates to Remick's (45.0 words), both studies are remarkably different from Broen's, Cross' and Sach et al.'s (69.2, 74.9 and 132.0 w/m respectively). This contradiction substantiates the point made earlier about the difficulty of selecting a norm and corroborating it in subsequent findings.

On the face of Ringler's results, black American mothers seem to be much better than white American mothers at assessing the processing limitations of their children, and at adapting and regulating their own speech rate to the developmental changes of their children. In other words, they are more finely-tuned than white mothers. However, this conclusion must be inconclusive for several reasons. Firstly, Ringler's study, like Remick's, must have been greatly influenced by what has earlier been called the intrinsic discourse factor. Neither Ringler's nor Remick's mothers were trying to have their children talk for the benefit of the experiment or the experimenter. Ringler's black mothers were waiting with their children for the next set of hospital examinations, and Remick's white mothers recorded their own speech at their own leisure. The silent times between utterances and the lack of motivation on the part of mothers to fill every silence with speech must certainly have depressed the number of words per minute. The effect of the intrinsic discourse factor is particularly clear in comparing the above results with those obtained in a language

laboratory, as in the case of Broen and Cross in which mothers were keen to involve their children in verbal interaction to co-operate with the experimenter. Results from experimental settings yielded a much higher rate of speech than results from relaxed environments. Such variability in maternal behaviour from one setting to another does not support a listener-dependent hypothesis and makes summary results across studies quite difficult and artificial.

The conclusion drawn from Ringler's study must be questioned for this second reason. Her values for A/A are the lowest of all white A/A. This could be due to the methodology of conducting formal interviews with mothers. Alternatively, the results could be peculiar to Black American English where, on impressionistic grounds, there seems to be a great variation in syllable duration and manner of delivery.

The third reason is crucial. If we wish to accept Ringler's conclusion that mothers finely adapt their rate of speech to the growing abilities of their children, we would have to do one of two things: either ignore the changes in A/A over a year (from 53.6 to 72.9 w/m) or accept that adults also undergo 'developmental' progress in talking to other adults. If adults change their rate of speech over time, as they do in Ringler's study, in speaking to both children and other adults, it is then difficult to support the theory that changes in adult speech are a function of the listener's age and/or his developmental changes. It is therefore important for research to investigate, under scientific conditions, what exactly controls the directional changes in maternal behaviour.

However, as every individual study argues that young children are exposed to a significantly slow speech matched 'admirably' to suit their limited abilities, it would be neither difficult nor artificial to obtain significance levels by summing across studies if indeed the listener, rather than extraneous factors, is the potential variable. Bard (1980) computed time t-tests across Remick's, Ringler's, Broen's and Cross' studies. The difference between the grand means of A/A and A/C failed to reach significance at a one-tailed t-test. This failure, Bard argued, would not occur if mothers aimed their speech at a 'window' of the child's abilities.

In short, then, while a slow speech rate is one of the most important cornerstones of the fine-tuning hypothesis, the results discussed above do not lend support to it.The discussion suggests the presence of at least two factors other than the child at play in the findings of researchers, and thus implies that adults' behaviour might primarily be constrained by interaction and very indirectly by the nature of the listener.

II. 1. e. Location of Pauses

This is another physical feature which reduces the task of language processing for the child. The findings for this parameter suggest that A/C is indeed different in pause distribution and this could be helpful to the naive listener. According to Broen (1972), the judicious placement of pauses might serve the double function of marking sentence boundaries and of decreasing the overall speech

rate. The discriminate introduction of pauses in the conversational stream limits the number of words a child has to process as well as helping the segmentation of the flow into constituent units, thereby contributing to perceptual and syntactic information.

In his analysis of the speech of one Black American mother to her 26-month-old child, Drach (1969) reported that the stream of talk was punctuated by silences at the beginning and at the end of segments. These substantial pauses rendered speech easily segmentable into units. As that quality was missing from A/A, Drach found it difficult to segment the stream of speech especially at sentence connectives. Phillips (1970) reported that there was systematic disagreement between her two judges in the treatment of sentence boundaries whenever a connective occurred; there was an 80% interjudge agreement in A/A segmentation in contrast to 90% agreement in A/C. Broen also reports a higher interjudge reliability in segmenting speech to younger and older children than to adults.

Using a computer programme, Broen identified pauses in excess of 260 msec. and marked their location in 3 environments: after sentence boundaries, after single words and at other locations. If pauses are to serve as maximum cues regarding sentences, Broen argued, they should occur always (and only) at sentence boundaries. The mean percentage across the 4 informants shows a difference of pause location between A/C and A/A conditions at other locations, single words and at sentence boundaries: 1.4, 23.2 and 75.4% respectively for younger children (mean 21 months); 10.6, 6.4 and

82.9% for the older children (mean 60 months) and 46.2, 2.6 and 51.3% for the adult.

Within her own definition of the sentence, Broen reported percentages of sentences that were followed by pauses, for each of the 4 mothers: 92.9% to younger children were followed by a pause, 76.5% to the older children and 29.4% to the adult. The percentages demonstrate that speech to children contains sentences well demarcated by pauses. Approximately similar results were obtained by Dale (1974). However, the coding of adult speech seems influenced by the methodology that Broen employed. In fact, she herself warns the reader about her analysis. Broen dramatically reduced the percentage of pauses by splicing run-on and conjunct sentences in which initially pauses do not occur, into two sentences which did not have pauses. Her method necessarily creates an artificial result for the adult values.

An informative analysis of pause distribution comes from Messer (1980). He investigated the role of pauses in demarcating successive utterances which referred to the same object, by videotaping the interaction of 42 mothers with their children of 11, 14 and 24 months. These results indicate that the interval between utterances which referred to different toys, was on average twice as long as the interval between utterances which referred to the same toy. The difference and its direction were consistent in all the subjects in each age group ($p<0.032$ 2-tailed sign test). Pauses therefore significantly frame the locus of a new object or a new sub-topic, thus yielding pragmatic information to the child

listener.

II. 1. f. Disfluencies

Broen (1972) defined disfluencies as the linguistically irrelevant repetition or interjection of sounds, words, phrases, or broken and retracted sentences. Obviously, disfluencies represent a major source of syntactic and psycholinguistic complexity if they occur in speech to children. Although the presence of fewer disfluencies in A/C than A/A has been rightly interpreted as a potential adjustment for the sake of the listener, the argument is weakened by the presence of other interactions in the results.

Broen found a substantial difference between the rate of disfluency for speech between a younger and older group and for speech to the adult. In free play there were 0.58 disfluencies per 100 words to younger children, 1.61 to older ones, and 0.66 to the young and 0.77 to the older in storytelling. An average of 4.7 disfluencies per 100 words in A/A was significantly different from the rate for the older listeners. Newport (1976) found significantly more disfluencies (false starts, hesitations, revisions, word repetitions) in speech to adults (5%) than in speech to children (1%). She also found significant differences in the proportion of unanalyzable utterances (garbled and slurred utterances) between A/A (9%) and A/C (4%). Such results do indeed argue that adults exert more care and more confidence (less hesitation) in speaking to children.

And yet what is surprising in Broen's data is that the age-by-task interaction was also significant ($F = 7.18$ $p = 0.95$). The rate of disfluencies increased for the younger listeners from free play to storytelling (0.58 to 0.66), but dramatically decreased for the older (1.61 to 0.77 respectively). Had a stage- or even age-dependent hypothesis been valid, then the interaction for task-by-age should not have been there in the first instance.

Fraser and Roberts' (1975) results (but not their interpretation) shed further light on this parameter. They recorded the speech of 32 mother-child pairs made up of 4 age groups; 1:5-, 2:5-, 4- and 6-year-olds. The two tasks were a free play with a 'village model' and a 'story' from a set of pictures. The number of words in disfluencies was counted over 1000 words. The age-by-task interaction was again significant ($p<0.05$). The mean for every age group was drastically higher in the free play village task than in the storytelling except for the 6-year-old age group which had a reversed result. Taken together, Broen's and Fraser and Roberts' results do weaken the hypothesis that the rate of disfluencies is low for the immature listeners since a variable extraneous to the listener, that is, the task, seems to exert a strong influence on this parameter. It seems, then, that young children are exposed to disfluencies depending on which task the adult is carrying out with them.

II. 2. Syntactical Features

Since the child approaches language largely as a foreigner,

researchers have argued that input to him must satisfy the description of an ideal, rather than a degenerate model for rule abstraction. That is, in order to argue that the child need not be credited with extensive prior structures, it is necessary to find that A/C is conspicuously different from A/A and that it pertinently highlights the underlying regularities and linguistic information the child must master. Researchers in the field have used a number of parameters which presumably tap various aspects of what might represent difficulties in input. Their argument asserts that since A/C is characterized by certain syntactic adjustments, these very features should ipso facto reduce sources of syntactic and processing complexities in input, thereby making the task of acquisition much lighter than has been previously assumed.

Each of the parameters used under this level of description has a number of beneficial interpretations attached to it. However, as is the case with the field, the fluctuations within and across studies do not always support the view that such syntactic features are a function of the immature listener or are produced primarily for the benefit of such linguistic immaturity.

II. 2. a. Mean Length of Utterance (hereafter mlu)

MLU is the cornerstone upon which the hypothesis of tailored A/C and A/A differences largely rests. The parameter is most widely quoted in the field as proof that adults produce a short and 'simple' model of language to suit the limited processing abilities of their listeners and to reduce the size of their syntactic load.

(The notion of simplicity, often a recurrent description, will be dealt with in Section V. B.) However, the analysis of findings discussed below casts doubts on the conclusions which researchers have drawn from mlu results.

As computed by Brown (1973), mlu in morphemes measured the developing lexical and grammatical knowledge of the child by counting the words and their inflections, and dividing the value over a set number of utterances. The principle behind it is that any new knowledge a child acquires will make his utterances longer and thus signal his development towards syntactic and semantic maturity. With regard to adult language, workers have counted mlu in morphemes, syllables or words. In all cases, the parameter provides a summary measure of complexity or simplicity of speech.

Researchers have enumerated the benefits of a low mlu in child-directed speech and have associated it with strong evidence of a tailored input to the child's needs. Snow (1972) argued that a low mlu is one of the 'tutorial' devices of A/C:

> Whatever the specific changes leading to shorter utterances, it seems clear that, in general, these changes are correlated with grammatical (and semantic) simplicity ... the surface structure, which the child hears, is related by a smaller number of steps to the base structure, which must be reached if the sentence is to be interpreted correctly ... the child's work in searching for the major units ... is consistently lightened. Finally, there are fewer inflections in a shorter sentence, this may improve the chances that the child will notice, remember and induce the rules governing the inflections that do occur[3]. (p.562)

As viewed by researchers, sentences are made simpler and shorter by the omission of possible sources of complexity. Kelkar (1964)

remarks that adaptations in A/C usually affect 'the relative frequency of competing grammatical markers and vocabulary items' (p.54). Ferguson (1971, 1975) points out that in 'simplified speech' as 'baby talk' and 'foreigner talk' inflections, articles, pronouns and auxiliaries are deleted and hence the length of utterances is abbreviated. Indeed, Cross (1977) reports that 'mothers can (and frequently do) use deletion operation which reduces sentence initial density ... They can delete auxiliaries and pronouns ... and also omit articles ...' (p.174). In fact, Newport (1976) argues that maternal mlu increases over time, owing to the replacement of constituents that have been previously deleted in the mothers' speech.

In order for such reduction operations and syntactic adjustments in adult speech to constitute a beneficial theory, they must be 'finely-tuned' to the child's abilities. Levelt (1975) explains the concept thus:

> an intelligent text presentation: the child is presented with grammatical strings from a miniature language which is systematically expanded as the child's competence grows (p.15, my emphasis)

More specifically, Cross (1977) states that:

> Mothers' utterances become longer as their children become linguistically and psycholinguistically more sophisticated ... on average, less than three morphemes longer than their children's and less than half a morpheme longer than the children's longest utterances [with] a consistent and significant tendency for this discrepancy to converge in tune with increases in the child's utterance length - indicating a very regular 'catching up' effect as the child drew closer to his mother's level of linguistic maturity (p.172).

According to the fine-tuning position then, adults 'programme' their

children's development by producing systematic changes commensurate with linguistic changes in their listeners, thereby expanding the miniature language-model to which children are exposed. This involves two operations: firstly, that linguistic information be gradually shifted back to surface structure, thereby effecting a systematic increase of adult mlu over time; secondly, that such retrieval anticipates the needs of the child 'one step ahead' to enable him to move to the next stage of development. Failure of either operation yields too easy or too difficult an input from which the child may benefit or suffer. However, neither one of these theoretical predictions is met.

Table 2.1 below provides a summary of the current word-based mlu investigations organised by the child's age. The results do show that the less mature listeners hear shorter utterances than the adult. Studies which have an adult base-line do report a significant difference between A/C and A/A; they also conclude that such a difference is a function of the limited linguistic and cognitive abilities of the listener.

TABLE 2.1: Maternal mlu (word-based) arranged by child age and task type. Means and standard deviation (S.D.) for age groups.

Age Group	Study	No. of dyads	$\bar{x}$ age of child months	Maternal mlu A/C	Maternal mlu A/A	Context	Age Group Statistics Range A/C	Mean	S.D.
8-12 months	Phillips (1973)	10	8	3.56	8.46	P	2.61-3.69	3.28	(0.58)
	Ringler (1973)	10	12	2.61	7.05	M			
	Longhurst and Stepanich (1975)	12	12	3.69	-	P			
18-20 months	Fraser and Roberts (1973)	8	18	5.0	-	SP	3.47-5.50	4.58	(0.82)
	Fraser and Roberts (1973)	8	18	5.5	-	S			
	Phillips (1973)	10	18	3.47	8.37	P			
	Furrow et al (1979)	7	18	4.02	-	P			
	Newport (1976)	15	19.5	4.94	11.9	P			
24-28 months	Snow (1972)	12	24	6.60	-	a	3.48-6.60	4.44	(1.14)
	Longhurst and Stepanich (1975)	12	24	3.85	-	P			
	Ringler (1973)	10	24	3.48	8.51	M			
	Cross (1977)	16	25.5	4.8	-	P			
	Furrow et al (1979)	7	27	3.93	-	P			
	Phillips (1973)	10	28	4.01	8.47	P			
30-36 months	Baldwin and Baldwin (1973)	20	30	4.67	13.2	P	2.84-9.00	5.52	(2.31)
	Fraser and Roberts (1973)	8	30	6.4	-	SP			
	Fraser and Roberts (1973)	8	30	9.0	-	S			
	Harkness (1977)	8	33	2.84	-	P			
	Longhurst and Stepanich (1975)	12	36	4.70	-	P			
48-120 months	Fraser and Roberts (1973)	8	48	7.0	-	SP	7.0-9.63	8.38	(1.09)
	Fraser and Roberts (1973)	8	48	9.0	-	S			
	Fraser and Roberts (1973)	8	72	7.5	-	SP			
	Fraser and Roberts (1973)	8	72	8.8	-	S			
	Snow (1972)	12	120	9.63	-	a			

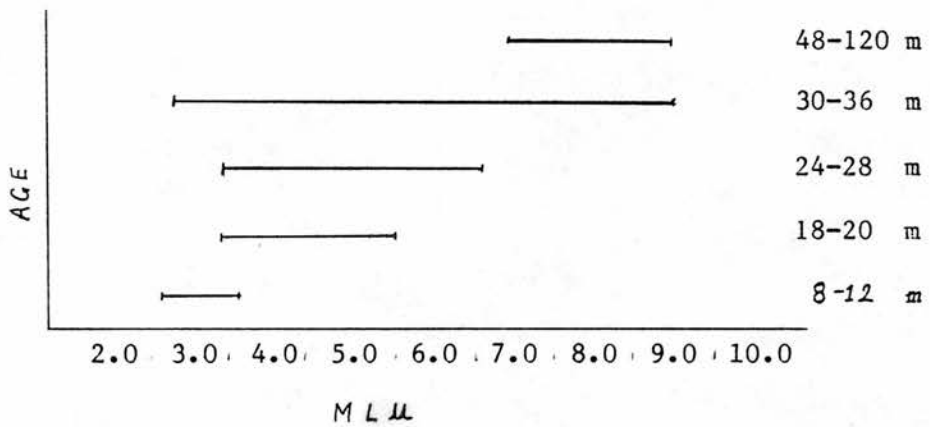
Legend: P = Free Play SP= Structured Play
M = Mothering Activities S = Storytelling
a = mlu scores were pooled by Snow for two tasks: (Storytelling and Teaching play)

Nevertheless, a close analysis of table 2.1 must necessarily qualify any firm conclusions concerning the listener-dependent characteristics of A/C. Viewed more dispassionately, the most striking feature of the table is the enormous differences within and between studies: differences and divergencies which are neither related to the listener stage as the theory predicts, nor to his age. If adults restricted their mlus to match or be ahead of the child's, or indeed if the limited abilities of the child had an effect on the adult as the theory assumes, then we would expect studies dealing with the same age group to yield similar mlu values. Unfortunately this is not the case. As table 2.1 shows, there are sizable A/C mlu ranges within single age groups.

The fine-tuning theory predicts that mlu changes in a 'systematic' manner with the child's linguistic and psycholinguistic development, exhibiting, as Cross argues, a 'very regular catching-up effect' of the child's mlu in relation to that of the mother. This means that the lower end of an mlu range should rise regularly over time and fall within a restricted range. The organization of studies in table 2.1 clearly demarcates a 4-month interval between every age group save the first one which has a 6-month gap. Four and six months in the early stages of the child's life are expected to be potentially developmental periods. To support the theory, we would need restricted mlu range values particularly demarcating the age range, with a rising lower end, or, at the very least, a rough retracement of the age patterns. Again, this hypothetical result is not replicated in table 2.1. The lower end of the mlu fails to rise in any 'systematic' or 'regular

catching-up' manner and the range of mlu is not in any way restricted to a specific age range. On the contrary, we get a very unexpected spread: every mlu range is almost contained within its previous and subsequent parameter value as depicted in figure 2.2 below.

Figure 2.2 - A/C MLU range values for 5 age groups in months (m)



The absence of any systematic pattern in these results is a severe setback to the hypothesis. It appears that shortening or lengthening utterances is neither geared to particular stages of the child's abilities nor even roughly guided by the child's age. The only objective conclusion we may draw from table 2.1 and figure 2.2 is that children in their (presumably) most rapid developmental stages (from 8 to 36 months) may receive utterances of varied lengths. Likewise, mothers in those crucial stages ring all changes of length from 2.61 to 9.0 words. The lower end of the mlu does not rise and the range is large; neither of these results supports the

previous conclusions that utterances are short, or that they increase in line with the stage or age of the young listener.

The fine-tuning theory is based on the assumption that A/C mlu is controlled by the linguistic sophistication of the listener; that is, if mlu of addressee varies, adult's mlu should vary and thus A/C variations are listener-dependent. However, the most surprising finding is that mlu seems to change according to the context of activities, irrespective of the listener. Reports of two studies exhibit upward movements in mlu to the same listener. In table 2.1, results from Fraser and Roberts (1973) have two different values according to the condition of recording. Their study, together with that of Snow, demonstrates the presence of contextual constraints on mlu values which are more powerful than the hypothesized constraint of the child's attributes.

Snow (1972) recorded the speech of 12 mothers to their 2-year-olds and 12 others to their 10-year-olds in a number of tasks of varying complexity (story based on pictures, instructions and teaching a physical phenomenon). The mothers were also asked to prepare tapes for their children in their absence. Figures from the absent condition are high: 9.84 words for 2-year-olds and 11.25 words for the 10-year-olds. It would have been of great interest had Snow provided mlus for individual tasks rather than pooled results. Nevertheless, Snow reports that in the difficult task, both mlu as well as sentence complexity increased. This is a surprising result which indicates that maternal mlu changes from one task to another although the addressee is the same. Moreover, it

suggests that mothers were not primarily engaged in making their language or the task simple to their children. Again, Snow's results, not her interpretation, prove this point. MLUs in the absent condition were higher than the present one (9.84 and 6.60 words to the 2-year-olds); so a child in her mother's opinion may be exposed to more complex speech than she actually receives.

A corollary of the fine-tuning linguistic control of the listener predicts, then, that A/A mlu is greater than A/C mlu. As the adult listener has a higher mlu than the child listener, a speaker's mlu to another adult should be much higher than that directed to a child. A/A mlus should always differ in the same way, being much higher than, and more distinctly different from, A/C mlus. The results, however, do not satisfy the expectations. By comparing mlu values of A/A and A/C in table 2.1, we notice the presence of a considerable number of overlapping readings between the two 'opposite' columns. Fraser and Roberts' results for A/C at 30 and 72 months (9.0 and 8.8 words respectively) and Snow's for 120 months (9.63 words) are higher than adult-to-adult speech values in Phillips' (8.46, 8.37 and 8.47 words) and Ringler's (7.05 and 8.51 words) studies. Snow's absent condition for the 2-year-olds (9.84 words) is also higher than Phillips' and Ringler's for A/A, and her 10-year-olds A/C absent condition (11.25 words) is very close to Newport's A/A value of 11.90 words. This result raises grave difficulties. Indeed, it seems that some mothers speak to their children in a more complex manner than others speak to adults. The overlap of A/A and A/C values is a most unexpected distribution which should <u>not</u> have taken place if mlu is solely or even largely

conditioned by the age of the addressee. In fact, the overlap of A/A and A/C mlus is a definite indicator that the listener's attributes cannot be the independent variable that exerts maximum influence on the speaker's mlu.

A final corollary to the hypothesis of adults' fine adjustments states that if mlu of addressee varies, so should speaker's mlu; if not, then there is no speaker variation. Although we would expect variation in the child's mlu due to linguistic development, and in turn, variations in A/C mlu, there is no reason to expect any such development with the adult addressee; consequently A/A mlu should remain constant or stable. However, the results gleaned from A/A findings (table 2.1) do not support such a corollary. A/A mlu undergoes fluctuations similar to those in A/C. Consider Ringler's 7.05 words for A/A to Baldwin and Baldwin's 13.2 words; also Ringler's own results for A/A over a year's period from 7.05 to 8.51 words (the issue was also raised in II.1.d for Ringler's A/A rate of speech). It follows then, that there are extraneous factors, other than the child or adult addressee, which play a role in determining the speaker's values and fluctuations.

At this point , two factors suggest themselves as responsible for the many divergencies from the hypothesis: i. the method of computing the measurement; ii. the individuality of the speaker.

i. As stated earlier, mlu involves selecting a unit of analysis - morpheme, syllable or word - counting its occurences and averaging it over a set number of segmentable entities. Some evidence that

the parameter itself may cause deflated or inflated values comes from Harkness (1977). Harkness recorded the conversations of eight mothers to their children aged two to three-and-a-half in a Kenyan village and counted their mlu in words. She does not describe the morphological system of the language, but her results suggest that there is no simple correspondence with orthographic word boundaries. Harkness' results are the lowest among word-based mlu, indeed lower than the result for the youngest age group. She quotes two examples of maternal utterances which, in their English translation provided, average 9.5 words, well outside her A/C value of 2.84 words. Had Harkness elected a count in morphemes/morphs, she might have been more closely adjusted to the morphology of the language she was analyzing. Without a baseline of A/A, little is known about the extent of difference, if at all, between speech to the adult and the child listener. In any case, her results show that the unit that goes into making an mlu value plays a role in determining its size. (MLU in morpheme of studies in English have higher values than those in words: see Lord, 1975; Lieven, 1978).

The second unit involved in calculating mlu and which can have a role in determining its size is the utterance. The boundaries of an utterance can be particularly ambiguous in spontaneous data and researchers seem to treat this as much less of a problem than do linguists. It has been suggested in II.1.e that Broen (1972) created artificial adult pause values by segmenting, at unlikely pause locations, all conjoined and run-on sentences. It has also been reported in II.1.e. that the segmentation of adult speech into utterances is problematic and has a low interjudge reliability.

Considering that the definition of an utterance is ambiguous in linguistic theory and is subject to ad hoc analytic decisions (Crystal, 1974), it is likely that a stretch of talk can be over-segmented producing a low average or under segmented yielding a high one. In other words, it is conceivable that researchers have used different criteria for segmentation and that these decisions are, in turn, responsible for A/A and A/C fluctuations and ultimately for the lack of interstudy agreement.

ii. The second factor which may cause the failure of replication in results is the individual style of the speaker and the extent of modification she brings to the interaction. Evidence that this issue may well be the case comes from Lieven (1978). Though Lieven computed mlu in morphemes, her two adult subjects displayed quite distinct verbal behaviour. Kate's mother produced 7.25 morphemes to her 18-month-old girl and 14.0 morphemes to the adult; Beth's mother produced 5.61 morphemes to her 20-month-old daughter and 20.0 morphemes to the investigator. The results are perplexing because the younger child receives a higher mlu than the older one. Nevertheless, Lieven's findings demonstrate that each mother-child pair exhibits unique behaviour. Hence pooling individual styles of speakers within and across studies may lead, in part, to the large variations observed. The same argument also applies to A/A baseline.

The view expressed above does not detract from the overall criticism in this section that irrespective of the speaker's idiosyncracies, the grand mean of A/C speakers should converge to a

near enough mlu value if it is indeed controlled or guided by the listener's attributes. In fact, Bard (1980) computed mlu t-tests for A/A and A/C difference across the studies of Newport, Longhurst and Stepanich, Phillips, Snow and Ringler. Unfortunately, the t-value failed to reach significance at a one-tailed test which, Bard argued, is not what would be expected had mothers adjusted to a 'window' of their children's perceptual abilities. Only by eliminating Snow's results could Bard's t-value for A/A and A/C difference reach significance.

In sum, adults seem to produce utterances of varying length under various conditions; the child's linguistic abilities are not necessarily one of them.

II. 2. b. Propositional Complexity

The argument for the usefulness of a low sentence complexity in A/C was presented by Snow (1972) and reinforced by all the measurements devised by researchers to tap sources of syntactic difficulty. The presence of fewer embedded clauses furnishes the child with greater ease in discovering the subject-verb (-object) rule of sentence production, Snow argued, than many multi-propositional utterances. Similarly, a low preverbal length contributes to a great syntactic unity between subject and verb; both indices act as finely-tuned tutorial devices. Therefore in comparison with A/A, A/C is expected to have significantly fewer utterances with more than one proposition. However, this expectation is not always fully realized.

Researchers have used different analytic decisions in measuring syntactic complexity and have presented their findings either in frequencies or ratios thus making results difficult both to compare with each other or to use in reaching a summary statement (as was done in II.2.a). In an analysis of 18 hours of A/C records to the Harvard children, Pfuderer (1969) found Adam at stage I receiving 94% simple sentences and 5% complex ones while at stage III the simple sentences dropped to 80% and the complex ones rose to 19%. Eve, the second child of the project, received 96% simple sentences and 3% complex at stage I. By stage III simple sentences had decreased to 73.5% while complex ones rose to 25%. The third subject, Sarah, was addressed in 95% simple sentences and 6% complex at stage I with a relatively small drop to 90% simple sentences and 9% complex ones at stage III. However, the percentage of complex sentences in A/A was surprisingly low, only 14% in comparison to Adam and Eve who received a higher percentage of complex sentences (19% and 25% respectively in stage III). That is, contrary to predictions, children may receive more complex speech than adults.

Ringler (1973) reported that mothers produced more simple sentences to their 12 and 24 month-old children (78% and 79% respectively) than to adults (46% and 41%). Remick (1971) counted the frequency of co-ordinate and subordinate clauses in A/C for her 16 and 30-month-old subjects. Figures averaged over the 8 children yield a mean of 20.9 clauses, whereas A/A yields a mean of 68.97.

Snow (1972) used two measures of sentence complexity: a ratio of compound verbs to the total number of utterances and a mean of the

total number of words before the main verb in all clauses. The compound verb ratio was significantly lower for the 2-year-olds than the 10-year-olds. Mean preverb length failed to reveal a significant difference for the age of the addressee, but both measures showed significant age x time x presence interactions. While this result entitles Snow to interpret the data as showing that mothers produce a simpler grammatical style to 2-year-olds, the other two results do not derive from her much-quoted evidence. Mean preverb length did not reach significance between the two widely different ages of listeners and there were no significant differences among the 2-year-olds absent, 10-year-olds absent or present condition. If mothers were systematic in reducing complexity to young learners, Snow's figures should have revealed a significant difference between the two ages on both measures of complexity and should have shown the same pattern when the absent and present conditions are compared for both ages. It may be argued that mean preverb length is not a sensitive measure; and yet that very measure significantly changed from the easy to the difficult task condition. It is indeed surprising that mothers did not significantly lower the complexity level of their speech in the difficult task. Rather, mothers' speech became increasingly complex as the task became more complex. While many researchers, including Snow herself, emphasize the importance of a sole result, findings on complexity measures should be taken together and we should make the following reservation: mothers react differently to 2-year-olds in one of two measures of complexity and only under the specific circumstances of the child's presence and the task's difficulty.

Phillips (1973) counted the number of verbs per utterance on the grounds that embedded utterances will have more than one verb and their matrix sentences will have more than one proposition. Speech to children of 8, 18 and 28 months scored significantly lower verbs (0.82, 0.80 and 0.92 respectively) than speech to adults (1.50, 1.57 and 1.53). Phillips replicated her study on girls of similar ages to the boys. While the overall results were similar for the different sexes, data on the number of verbs per utterance showed some variation. There was no significant difference on that parameter between the 18 and 28-month-old girls though there was for boys of this age.

A roughly similar measure to Phillips' comes from Newport (1976) who counted the mean number of underlying sentence nodes per utterance equivalent to the mean number of main verbs. Newport taped the conversations of 15 mother-child pairs in three age groups: 12-15 months, 18-21 months and 24-27 months. The mothers produced 1.16 S-nodes per utterance to their children and 2.66 to the experimenter. The difference between A/A and A/C is very significant ($t=9.93$ $p<.001$). Cross (1977) followed Newport's measure and her 16 mothers produced 1.03 proposition per utterance to their 19 to 32-month-olds. Cross does not supply an adult baseline for comparison, but her results for A/C lie between Phillips' and Newport's.

The overall results suggest that A/C has a lower level of complexity than A/A thus making it psychologically easier to process than A/A. There are, nevertheless, two reservations: first, not

every complexity measure demonstrates significant A/A and A/C differences and second, it is not clearly evident that adults can control the complexity of their speech in direct response to the child or to the task. That is, the simplicity of adults' speech is limited in certain ways.

II. 2. c. Surface Structure Features

The distribution of sentence types in A/C is one of the major characteristics distinguishing it from A/A, and one which has been taken to indicate that A/C teaches syntax. However, the nature of the differences contradicts the predictions of some current descriptions of language processing. Although these predictions are primarily applicable to adults, researchers have projected them on to children's abilities. According to these predictions, in the first decade of his life the child learns 'primarily how to talk in sentences, how to understand sentences and how to predict new sentences in his language' (Bever, 1970 p.280). Since the unit with which the child learns to operate is assumed to be the sentence, then it must be clearly defined as a distinctive unit; hence the interest of researchers in counting complete utterances and interpreting them as a more 'ideal' teaching device than incomplete or fragmentary ones.

Not only the frequency of complete sentences but also their structural characteristics have been investigated; however, the results do not agree with theoretical expectations. According to Fodor, Bever and Garrett (1974) processing is left to right in a

single pass and preferably in a subject-verb (-object) order. Both these hypotheses about the ease of comprehension require minimal rearrangement and pre-posing of constituent structures and hence the preservation of canonical order. Since the simple affirmative active declaratives are needed for the greatest ease of simplest deep structure recovery, input to the child should contain a majority of such sentence types. Unfortunately, the findings that characterize motherese do not fulfil such predictions. Below is a review of sentence types and their assumed beneficial value.

i. Fragments of utterances

Contrary to expectations of an 'ideal' input of complete sentences, there are more fragments in motherese than in speech to adults. Broen (1972) reported that Brown and Bellugi's (1964) comment that mothers use short, simple and grammatically complete sentences was not exactly correct. About 14.9% of mothers' sentences to 2-year-olds were single word sentences uttered with sentence-like intonation contours and were not grammatically part of either the preceding or the following sentence. About 15.2% were grammatically incomplete owing to the deletion of pronoun, obligatory 'do' or 'be' or even the deletion of subject noun-phrase.

Snow (1972) found that about 16% of utterances to 2-year-olds did not follow subject-verb rule. Paradoxically, speech to 10-year-olds was more well-formed containing significantly fewer verbless utterances than speech to the younger children. Ringler's (1973) average for the two sessions shows 30% sentence fragments (an

unusually high reading) in A/C compared to 16% in A/A. Newport reports a significant difference between A/A and A/C with children receiving more fragments than adults (9% versus 17%).

The high range of fragments in A/C (15% to 30%) contradicts the prediction that complete sentences are more 'ideal' input than non-complete ones. Nevertheless, researchers have construed fragments to be beneficial to the acquisition process. Snow (1972) argues that utterances which run counter to the subject-verb rule may really be 'tailor-made' lessons in phrase structure rules rather than a 'degenernate' input (also Vorster, 1975). Pfuderer (1969) and Broen (1972) propose that such syntactically incomplete sentences serve as attention-getting devices. Cross (1977) accepts that such fragments are not ideal models of input but argues '...that ill-formed sentences...' represent language '...which the child eventually will have to learn to use' (p.177).

Such arguments seem unconvincing. Complete sentences are helpful and yet incomplete ones are also helpful according to motherese workers. Although fragments are not the majority of A/C as Chomsky (1965) had argued, they represent, however, a source of complexity. Even if the proportion of fragments was much lower than the one reported, the child will still have to learn to distinguish the ill-formed sentences from complete ones. Findings for this parameter do not necessarily support the notion of an ideal stimulus. At any rate, the frequency of fragments in A/C would obviously reduce the number of words per utterance, thus yielding a short mlu.

ii. Word Order

The distribution of sentence type is one of the major characteristics of motherese, one which is closely studied for its tutorial value, which causes disagreement among workers and which violates some theoretical expectations. Researchers who espouse the 'useful' outlook on any aspect of input argue that surface-structure distribution in A/C is ultimately geared towards a syntax-teaching bias, presents a 'miniature model' with 'tutorial devices' (Levelt, 1975 and Snow, 1972, respectively) and is therefore a listener-dependent syntactic adjustment. Other researchers (Shatz and Gelman, 1977 and Newport et al., 1977) argue that the distribution arises from the limited 'here-and-now' communication with a linguistically and cognitively naive listener.

However, the typical word-order in motherese is not Subject-Verb (-Object) as predicted by a theory of 'ideal' input. Because researchers have classified sentence types differently, their results are not directly comparable, and consequently there is a great deal of inter-study variation[4]. Nevertheless, all researchers report a majority of non-canonical structures. Ringler (1973) found fewer declaratives addressed to one- and two-year-olds (21% and 13%) than to adults (96% and 95%). Newport (1976) found significantly fewer declaratives and deictic statements to children (30% and 7%, respectively) than to adults (87% and 2%, respectively). Other researchers (Drach, 1969; Broen, 1972; Remick, 1973) report similar differences in A/A versus A/C.

The scarcity of declaratives in A/C is balanced by an abundance of imperative and interrogative sentence types, the benefits of which have been enumerated by researchers. Imperative sentences which have a deleted subject are of didactic value to Mahoney and Seeley (1976) because:

> The imperative is a bare verb phrase in which the verb is unmarked for number and tense ... so that it should provide the language learner with information regarding the basic relationship that occurs among the words in the verb phrase[5] (p.83).

Broen (1975) and Benedict (1975) argue that imperative sentences can furnish the child with information concerning the segmentation of speech as well as the process of embedding, since there are frequent examples of embeddings in longer sentences ('Give me the doll.' 'Can you give me the doll?'). Cross (1977) also points out that by replacing the otherwise deleted subject in imperative sentences, mothers can make the underlying structure more explicit to their children (also de Villiers and de Villiers 1978).

As Newport (1976) points out, imperatives are syntactically deformed in comparison to an easily retrievable canonical structure; their presence in motherese is due to the uncontrollable behaviour of the child listener and not due to any teaching need. However, if we want to accept the didactic interpretation above, we would expect mothers to display a uniform frequency of 'useful' imperative structures in speaking to their children. Yet this is exactly what we do not find. Apart from variability due to different classificatory decisions (see note 4), the range of imperatives seems not to be dependent on the listener as would be expected. Newport reports 18% of all sentences to be imperatives; Furrow et

al. (1979) quote 21% imperative sentences at 18 months and 19% at 27 months, while Ringler, whose study falls between the age range of Furrow et al. and Newport, reports 58% at 12 months and 59% at 24 months. Rondal (1980) has another intriguing figure for children between 18 and 36 months; mothers produce 11% imperatives in one situation (meal) and 5% in another (storytelling). Such results suggest neither a syntax-teaching strategy nor an uncontrollable listener or an authoritarian mother.

As with imperative types, the potential tutorial value of interrogative sentences and their sub-classification have been focuses of attention for many researchers. Interrogatives and their sub-categories are significantly more frequent in A/C than A/A. Although they violate the easiest structure by rearrangement of constituents, the underlying argument for their abundance in A/C is that they serve a syntax-teaching role. Gleason (1973) points out that adults frequently rephrase questions by changing them from elaborate to simple ones ('What is that?' to 'Is that a ball?') and sometimes provide the answer themselves. According to Gleason, such a sequence is didactic, furnishing the child with information concerning the relationship between the interrogative and declarative forms or between one question form and another. Brown and Bellugi (1964) identified the occasional questions with final wh-question word as a frequent form in maternal speech which has a tutorial role; occasional questions might facilitate the child's learning of the membership of constituent sentence units. De Paulo and Bonvillian (1978) suggest that constituent prompts which are provided by such questions may often 'relate superficially diverse

surface expressions to similar underlying base structures' (p.204).

Sachs, Brown and Salerno (1976) suggest that the 'interrogative form could be useful in clarifying the underlying sentence structure' (my emphasis, p.244) since it places the auxiliary form in a perceptually salient position at the beginning of the sentence and thus separates it from the remaining words. Moreover, Sachs et al. remark that the adult's habit of using sequences of different sentences with the same meaning is beneficial to the child both in increasing his chances of understanding at least one of the sentences and in showing him different sentential configurations to express himself.

Cross (1977) tackles the interrogative type with a fine-tuning hypothesis in mind. She proposes that the complexity of Yes/No questions is reduced by the co-existence of multiple levels of realization and in turn of multiple levels of psycholinguistic difficulty. Cross uses Slobin's (1973) operating principle of avoiding interruption or rearrangement of linguistic units to argue that an auxiliary fronted Yes/No question is more complex than a deleted auxiliary one, as in raised intonation (e.g. You're hungry?). The former structure defies the child's operating strategy whereas the latter is better suited to it. Moreover, Cross contends that raised intonation types are processed and are learned easily because of their similarity to the child's own early form. According to her reasoning, only one sub-classification seems the easiest to learn while all other forms (fronted auxiliary and wh-questions) are difficult because they are opposed to the child's

processing strategy. If mothers were to select the easiest and most learnable form with regard to the child's operating principles, then other sentence types (especially wh-questions) should be avoided. There is not one single report in the literature that such is the case; rather, the abundance of interrogatives is the most distinctive characteristic of A/A and A/C differences. Moreover, it is difficult to agree with Cross that the child learns the raised intonation (that is, deleted fronted auxiliary which presumably involves two syntactic operations) rapidly because it resembles his own production. If the child already possesses a structure, presenting him with a replica of his own utterances does not provide him with any new information from which to learn. Again, this runs counter to the fine-tuning notion of leading the child into the acquisition task.

Ironically, wh-question types receive little acclaim for their useful role despite the fact that they are significantly more in A/C than A/A. Inference from Gleason's example above places the type as more syntactically elaborate than the perceptually salient fronted auxiliary type. Indeed, Clark and Clark (1977) remark that in terms of Brown and Hanlon's (1970) cumulative derivational complexity, the devices used to express wh-questions seem to be formally more complex than those used to express yes/no questions. Similarly, from the point of view of acquisition 'wh-questions lag behind yes/no ones at each step in acquisition' (op.cit. p.354).

In view of the formal complexity of interrogative sentence types, a syntactic adjustment to the child's ability would therefore

lead us to expect fewer wh-questions in particular and less rearrangement and deletion of constituents in general. Unfortunately, this is not the case. As Newport, Gleitman and Gleitman (1977) argued, A/C seems in many ways more complex than A/A. A/C contains significantly more rearranged and preposed constituents (44% in their data are questions of various kinds) than A/A (9%); likewise, A/C contains significantly more surface deletion by the use of imperatives (18%) than A/A (2%). The authors concluded that such syntactically complex structures cannot arise from the needs of mothers to promote the language acquisition of their children, but rather their need to control and support conversation with them (also Shatz and Gelman, 1977).

However, neither Cross' nor Newport et al.'s hypotheses are strengthened when we analyse Rondal's data. Rondal argues for a fine-tuning didactic approach although his results do not fit his interpretation. If mothers were adjusting either to the learning or the communicative needs of their children, they would exhibit uniform behaviour across the three situations investigated. That is, mothers would have either reduced or increased their use of interrogatives and imperatives to their same listeners irrespective of the task. This does not happen. Rondal's results for the analysis of variance demonstrate highly significant interactions for the task. The significant changes in the distribution of surface structures from one situation to another cast doubt on both Cross' and Newport et al.'s arguments.

II. 2. d. Sundry Syntactic Features

In their longitudinal study of three children's grammar from stages I to III, Brown et al. (1969) compared the frequency with which mothers produce nouns, pronouns, inflections, adverbial questions, prepositions and verbs to the development of those categories in their children's speech. The positive correlation between parental frequency rank for adverbial questions and the order in which children began to produce them, led researchers to investigate the distribution of sundry syntactic features in A/C and A/A. Although the underlying assumption is that such features are geared to the linguistic levels of the child, the results do not always support such a conclusion.

i. Function And Content Words

Two studies give quantitative statements about the frequency and direction of this parameter. Function words (such as prepositions, possessive pronouns, inflections, articles, etc.) were less frequent to young children in Phillips' and Ringler's study (19% and 14% respectively) than in speech to adults (28% and 25%). It seems, then, that in speaking to one- and two-year-olds adults drop such functors. While this aspect of A/C is often quoted as evidence of facilitating the child's task by eliminating complex structures and reducing the length of sentences, not all researchers share that view. De Paulo and Bonvillian (1978) suggest that the omission of functors from A/C could hamper the linguistic development of the child since functors are just those parts of speech which emerge late in a child's language. The authors contend that exposure to A/A speech may better enhance the child's progress on this

parameter.

It is important at this point to realize how the fine-tuning theory came about. It has been mentioned in II.2.a that researchers believe that adults delete elements where they should occur for the purpose of shortening sentences. Workers also believe that adults avoid using constructions which require such syntactically complex elements. Influenced by such a view, it was vital then to create a theory which replaced functors into A/C at crucial points in the child's linguistic development. If no replacements are made, the child may always be handicapped in his acquisition since the language to which he is exposed does not provide functors. As the stages of the child's progress are not correlated with age, the provision of absent elements should be continuous throughout the developmental period and indeed be controlled by developmental stages. Hence, the raison d'être of the fine-tuning theory.

Not only functors, but also contentives were measured. These high information words (nouns, verbs, adjectives and adverbs) are more frequent in A/C than in A/A. However, the results do not necessarily support the fine-tuning position. The mothers in Ringler's study directed more content words to their 12- and 24-month-olds (55% and 61% respectively) than to the experimenter (44% and 49%). Paradoxically, Phillips' subjects behaved similarly to both types of listeners: 35%, 37% and 36% to children versus 31%, 32% and 32% to adults. The difference between A/C and A/A is large only in Ringler's study. While both studies followed the same methodology and used similar age groups, their results demonstrate a

huge range for both adult and child listener: 31% to 49% for A/A and 35% to 61% for A/C. It is obvious from these findings that the addressee, whether adult or child, is not the sole determinant of the distribution of contentives. That is, a fine-tuning position is not well supported.

ii. Abstract Versus Concrete Nouns

Evidence that mothers use more concrete nouns than abstract ones in talking to children comes from Phillips and Ringler. Only for the 28-month-olds Phillips reports significant differences between A/C and A/A on the ratings of concrete nouns. Ringler reports that over 80% of nouns used to children were concrete and referred to objects in the here-and-now. There were far more locative nouns and adverbs in A/C than temporal nouns and adverbs, whereas the opposite was true for A/A. It stands to reason that such should be the case since the topics dealt with between mother and child are governed by free-play sessions while those between mother and experimenter are governed by the mothers' rearing habits (which is what they were discussing with Ringler).

iii. Verbs

The distribution of verbs in motherese differs from speech addressed to adults. Researchers have interpreted this difference to be indicative of a processing bias by mothers towards the selection of the regular and easy forms of the verb (see Vorster, 1975; also Newport et al., 1977). However, such a view is not

always supported.

Phillips (1973) counted the frequency of strong verbs (usually old English) and weak verbs (usually of Latin and French origin). Adults used significantly fewer weak verbs and significantly more old English verbs to children than to other adults. Paradoxically, mothers were not trying to produce the regular form of weak verbs, but the irregular one of strong verbs. This is not exactly what would be expected had mothers been guided by a processing bias towards a regular pattern.

Ringler (1973) reports that mothers produce considerably more action verbs to children (83% and 78%) than to adults (56% and 63%) and in turn, more verbs about animal and human movement. This observation seems to explain the frequency of strong verbs in Phillips' data better than the syntactic selection proposed by workers. In English, a large proportion of action verbs are also strong verbs with irregular past tense patterns (e.g. go, do, make, run, fall, etc.).

The use of present tense verbs in motherese was interpreted as another maternal strategy towards structural and semantic ease in speech to the linguistically naive listener. Newport et al. also contend that the present tense is part of the topical and processing constraint on A/C. Therefore, it is expected that A/C will have significantly more present tense verbs than A/A. Whereas Remick's (1971) study on tense and her interpretation seem in line with the expectation, her actual results contradict it. Mothers playing with

their children at home produced present tense verbs which varied in frequency from 68% to 92%. The same mothers talking to the experimenter produced almost similar variation in present tense verbs from 56% to 87%. If mothers were indeed guided by a syntactic or even a topical strategy to suit the abilities of the listener (either child or adult), we would not have had such wide variation in the range of present tense in both A/C and A/A. Rather, the mothers would have exhibited a uniform behaviour quite distinct in talking to the child and to the adult. Remick's data demonstrate that there is no great difference between A/C and A/A on this parameter.

iv. Pronouns

In comparison to adult speech to other adults, motherese is characterized by a different distribution of pronouns. The difference has been construed to serve the double function of reducing sources of complexity and of exhibiting solidarity and affection to the young listener.

Snow (1972) reported that third-person pronouns were less frequent in speech to 2-year-olds than in speech to 10-year-olds. Mothers repeated the subjects and objects of their sentences rather than using pronouns. Snow argued that a subject-verb relation may be obscured when a pronoun is substituted for the subject noun-phrase, which has more obvious semantic reference to an actor or a topic. Remick (1973) noted that mothers seemed to take into account their children's egocentricity by the frequent use of the

child as subject of utterances. Wills (1977) extensively analyzed the use of pronouns in motherese, noting that adults employ the inclusive 'we' to express multiple semantic intentions and thereby to simplify the burden of acquisition.

II. 3. Discoursal Features

A striking feature of the motherese corpus in comparison to adult directed speech is its redundant character. The parameters which have been used include type/token ratio, repetition and expansion. Discourse features have been interpreted to arise as a response to the child's limited linguistic and psycholinguistic abilities by reducing the semantic complexity and quantity of input to the child. However, comparisons across studies of similar child ages do not always produce a limited range for such features to support this interpretation. The findings suggest, rather, the interplay of other variables.

II. 3. a. Type/Token Ratio (hereafter TTR)

There are two methods of calculations for this index. The first divides the number of types in a sample which are spelt differently or correspond to different dictionary entries by the total number of tokens (strings of letters between spaces) in a sample. This method has been followed by Broen (1972), Phillips (1973) and Ringler (1973). The second divides the number of different words by the square root of twice the number of words in a sample (Drach, 1969; Remick, 1971). In either case, a low TTR indicates that a

conversation contains a limited vocabulary and/or a limited range of sentence patterns as well as a high proportion of repetitions; a high TTR, on the other hand, indicates a diverse and varied vocabulary and a low proportion of repetitions.

Workers have reported a significantly lower TTR in A/C than in A/A. Phillips finds a significant difference for children in three age groups of 8, 18 and 28 months (0.31, 0.34 and 0.41) in comparison to adult values of 0.51, 0.52 and 0.52. However, TTR seems to depend also on the nature of the event and not solely on the nature of the child. Broen's figures show that the index is higher in the storytelling task than in the free-play one, although the interaction is not significant. Fraser and Roberts' (1975) study shows a very significant effect (0.001) for storytelling in comparison with structured play with the same child listener. It seems, then, that not only the limited attributes of the listener restrict the range of vocabulary directed to him, but also the type of task exerts a significant effect.

II. 3. b. Repetition of Mothers' Utterances

Speech addressed to children includes more verbatim repetitions of maternal utterances, part or transformed repetitions and paraphrases than speech directed to adults (see Kobashigawa, 1969 for an extensive study of this aspect). Snow (1972) argues that repetitions are a major tutorial device which increase the child's processing time under the constraint of his limited memory span. Partial and full repetitions also provide the child with a 'valuable

object lesson in the basic linguistic skills of rearranging units to form new utterances' (p.563).

Whereas researchers do not use directly comparable classification, those who do exhibit great variation in their data. The variability does not suggest that the feedback of children's ages or linguistic needs directly triggers repetitive behaviour in mothers; nor does it suggest that mothers uniformly follow tutorial objectives. Rather, the nature of the ongoing activity as well as the style of individual mothers contribute to the values reported. Snow found that, depending on the task, 3 to 8% of utterances to 2-year-olds were complete repetitions of the preceding maternal utterances. Cross (1977) found only 1.3% to be exact repetitions out of 28.2% of total repetitions. Newport (1976) reported 8% out of a total of 23% to be verbatim repeats of previous utterances whereas Harkness (1977) reported 17%. The style of individual speakers is reflected in the differences between 2 mothers in Friedlander et al.'s (1972) study; one mother produced 2.2% repetition to her babbling child while the other produced 29.7%. Irrespective of the benefits of repetition, it is tempting to suggest that if mothers finely tuned their speech to that of their children, we would expect very few instances of repetitions since tuning takes place.

Although Snow argued that paraphrases were valuable demonstrative devices, not all workers use this index. Snow reported that 14% of utterances to 2-year-olds were paraphrases of preceding maternal utterances and significantly more (3 times as

many) than those to the 10-year-olds. Cross, on the other hand, found a much smaller percentage (4%) than Snow. (Extensive cross classification for this and other discourse aspects are found in Wells, 1975.)

II. 3. c. Imitation and Expansion of Child's Utterances

This feature of A/C has been studied both observationally and experimentally to establish its potential effect on the child's language development. However, results gleaned so far seem confusing and inconclusive.

Brown and Bellugi (1964) remarked that mothers responded to their children's utterances by imitating or repeating those utterances. This behaviour was described as expansions which 'retain the words in the order given and add those functors that will result in a well formed simple sentence that is appropriate to the circumstances' (p.147). The authors argued that expansion might be a syntax-teaching strategy which provided the child with the correct adult model in the context of his own utterance. In that respect, then, expansion is a 'contingent model' which shows the child the relationship between the meaning he is trying to express and the correct form of expressing it (Foss and Hakes, 1978).

Although expansions have been interpreted as a strategy to teach the child, they may have no such purpose. Adults talking to children tend to confirm frequently what the child has just said; in repeating the child's message adults produce their own correct form

of that message without any causal relation. Indeed, adults may simply imitate or expand a child's utterance for the simple purpose of keeping the channels open, using this means to elicit more interaction with their interlocutors.

Irrespective of their motivation, if expansions are a facilitative aspect of the motherese corpus, there should be a high percentage of them in individual observational data. Moreover, in order to argue that expansions are geared to the needs of the listeners, variations among studies of comparable child ages should be within a restricted range. Unfortunately this is not the case. Brown and Bellugi recorded a 30% rate of expansion to Adam and Eve and about half that to Sarah. De Paulo and Bonvillian suggest that expansions may have played a role in Adam's and Eve's rapid language development and in Sarah's slower one. However, Brown and Bellugi's high percentage is not replicated in other studies and could also be an artifact of transcription as Newport (1976) points out; maternal expansions could have been translations of the child's intentions done for the benefit of the experimenter. In her own study, Newport noted to whom utterances were directed, and assured mothers that she had understood the child's utterances; consequently her results were dramatically lower. Only 5% were expansions out of the 11% total of child's imitation; and whereas the highest percentage of expansion by any mother was 12%, 2 out of the 15 mothers did not expand at all.

Friedlander et al. (1972) reported that in one family 3.7% of the mother's utterances could be defined as expansions, while not

one utterance in the samples of the second family fitted that description. Nelson (1973) found that only a little more than 1% of all maternal utterances to 24-month-old children could be classified as expansions. The highest rate for any mother was 9% and 4 out of 18 mothers did not produce expansions at all. Even Cross (1977), who made extensive sub-classifications of this category, does not have results comparable to those of Brown and Bellugi. She found that 17.8% of maternal utterances were expansions (complete, incomplete, elaborated and transformed versions) whereas the total number of extensions of the child's noun phrase, pronoun and predicate amounted to 34.7%. Together with imitations of the child's utterances, 55.1% of maternal utterances in Cross' data are not new contributions to the discourse. In fact, Cross' subjects were exposed to a peculiarly low percentage of novel utterances (5%) and semantically new ones (15%), whereas Newport's subjects received 66% new utterances. The percentage of new utterances is another piece of evidence for the repetitive nature of the motherese corpus; however, a comparison of the two studies mentioned above reflects either a striking difference between the behaviour of different mothers or between the scoring procedures of different researchers.

The observational data did not yield a reliable figure for the quantity or time that should be devoted to expansions in order for them to affect language growth. In many respects, this is also the main criticism which is directed to the subsequent set of intervention studies. These, it was hoped, would investigate the effect of the augmentation of expansions on children's language abilities. Cazden (1965) separated 12 black children ranging from

28 to 38 months into three groups: the first group received expansions for every utterance they said (actual rate about 80%) for 40 minutes each schoolday for three months. The second group (modelling) spent just as much time with the experimenter who deliberately avoided expanding their utterances but produced a rich sample of adult models by reading a picture book to them. A third group (control) received no treatment but were given a pre- and post-test in the training session room to determine their progress. Cazden's results, based on a comparison of pre- and post-test of the children on six measures of morphology and syntax provided no evidence that expansions aided language development. Children in the modelling group seemed to have gained most, while the expansion group did slightly better than the control. The results suggest an insignificant tendency for modelling, rather than expansion, to promote language acquisition.

Cazden's study has invited much criticism (McNeill, 1970). Mahoney and Seely (1976) argued that since expansions require that language models reflect the child's semantic intentions in the expanded models, mothers, rather than the experimenter, may more accurately preserve their children's meanings. Similarly, Foss and Hakes (1978) pointed out that the high rate of expansions suggests that the experimenter may have guessed at the child's intention, thereby producing inappropriate and misleading expansions. Futhermore, because 80% were expansions of the child's own utterances, the models produced for the expansion group must have been a less rich and varied, and in turn, a less motivating, sample of adult utterances than the modelling condition (De Paulo and

Bonvillian, 1978). Finally, as the experimenter spoke Standard American English to speakers of a different dialect (Black American English) the dialect difference may have interfered with language development rather than facilitated it (Foss and Hakes); or indeed may have amounted to the acquisition of a new dialect variety as Bard (1980) remarked.

Feldman (1971) repeated Cazden's experiment with several amendments to group number, content and dialect difference. Twenty-four white children ranging from 30 to 46 months were distributed into three groups. The total expansion group had all its utterances expanded; the second group had expansions only when the experimenter was fully certain of the child's semantic intentions, and the third group received completely new utterances. Each group received input augmentation for a thirty minute session once a week for three months. The results were disappointing. Again there were no significant differences on a sentence imitation test between the groups, but this time the total expansion group tended to show most improvement although it was scarcely significant.

The third experiment by Nelson, Carskaddon and Bonvillian (1973) distributed 27 white children aged 32 to 40 months into three groups. The Recast-Sentence group had its incomplete sentences expanded and the complete ones recast in a different syntactic form. The New-Sentence group received short, simple and grammatically complete sentences which excluded the content words in the child's original sentence. The control received no treatment. There were

two twenty-minute training sessions per week for only eleven weeks. Significant post-test differences were found between the Recast-Sentence group and the control on 3 out of 5 developmental measures: verb construction, auxiliaries per verb and sentence imitation. No significant differences were found between the Recast-Sentence and the New-Sentence groups or between the New-Sentence and the control groups.

Although the authors concluded that expansions facilitated syntax acquisition, there are several reservations on that conclusion in the light of previous studies. The classification of the Recast-Sentence involved two factors, either of which could have contributed to the greatest gain in the results. In Nelson et al.'s Recast-Sentence, new syntactic forms (similar to Cazden's modelling group) were introduced and incomplete sentences (similar to Feldman's expansion group) were expanded. As stated above, both Cazden's modelling group and Feldman's expansion group exhibited a tendency towards greatest gains. Therefore, in Nelson et al.'s mixed category, there is no way of discovering if the significant result is due to the introduction of new syntactic forms, to the total expansion of children's incomplete sentences, or to a combination of both.

There is also the possibility that members of the control group performed badly because of their unfamiliarity with the situation and the experimenter. Cazden (1972) remarked that unfamiliarity with the testing situation decreased the child's language output; in her own study the control group was twice sent to the training room

to familiarize the children with the situation. The order of significance on the three measures of development between the Recast-Sentence and the control group is low, and if we exclude the result of the measure most likely affected by the familiarity aspect of the situation (sentence-imitation), we have even weaker results to support the authors' conclusions.

Finally, augmentation of input may not necessarily have the beneficial effect that the authors claim, just as a short and simple input may not promote acquisition as the motherese workers argue. After all, Nelson et al.'s New-Sentence group received short and simple sentences, but did not develop more quickly in comparison with the control group. A fine-tuning hypothesis would lead us to expect that they should. It may be the case, as Slobin (1968) suggested, that expansions play a significant role only in the very early stages of syntax development. Since Nelson et al.'s subjects were past that stage, difference between the groups was likely to prove minimal. Alternatively, it may be the newness and variety of content and structures, rather than sheer frequencies, which most affect development.

Indeed, Nelson (1981) himself proposes 'a rare-event cognitive comparison theory' which argues that frequency of occurrence of adult models is irrelevant when the child is not prepared for comparisons between input to him and his own production. Obviously, determining the child's preparedness is a crucial issue. Yet, rather than risking mis-augmentation and possibly causing subsequent deprivation, securing a rich and varied input is a safer

undertaking.

III. Speech of Others to Children

In order to test the hypothesis that A/C is not just A/A, it is important to discover that all adults in the presence of a child adjust their language. Indeed, in order to test that the addressee controls the characteristics of motherese as the fine-tuning theory predicts, it is necessary to show that cultural, socio-economic and role-related factors do not influence the nature of child-directed speech. This section reviews the evidence gleaned from the relevant research. Although such evidence may not lend support to a fine-tuning position, it does suggest that the motherese phenomenon is not peculiar to white middle-class mothers speaking English to their own children. It is even conceivable that Chomsky's assumption about children's striking uniformity of grammar production could be related to the striking uniformity of the motherese phenomenon itself.

The relevant literature below is organized into three sub-sections: research into cross-cultural background, into the socio-economic factor, and finally into the sex and role of the adult speaker vis-à-vis any linguistically incompetent listener including the child and the foreigner.

III. A. Cross-Cultural Research

Blount (1972, 1977) analyzed Luo parental speech to two children

and incorporated Kernan's unpublished data for one Samoan speaking family. He reports differences from the English data in the distribution of surface structure types, especially in the preponderance of wh-questions. Blount interprets this difference to be triggered by one of the attributes of the listener, namely his reduced status vis-à-vis the adult speaker. In his opinion, parents treat their Luo and Samoan children as conversational inferiors who do not initiate activities, and who consequently are often given commands and frequently asked wh-questions. Following Blount's line of thought, then, all children are questioned and commanded to do things most of the time and this explains why there are so many non-S-V-O structures in motherese. Alternatively, the frequency of questions in Blount's data could be due to the reaction of his subjects (adults and children) to a white investigator who was presumably keen to have the children talk and to have their parents elicit speech from them. Nevertheless, Blount reported that parents modified the number of morphemes per utterance, the syntactic structures used, and the semantic distinctions expressed, in speech to their children.

Harkness (1976) provided an impressionistic description of the speech of Guatemalan mothers to their children. She felt that mothers 'did not speak more slowly or markedly change their intonation and stress pattern in the way suggested by Brown' (p.110). Moreover, sentences were not shorter than in speech to adults and syntax was not noticeably simplified. (This confirms the issue raised in II.2.a. concerning Harkness' unwise decision to count mlu in words in inflected languages.) On the other hand, there

were similar features to English motherese such as a highly repetitive speech and the use of abbreviated forms. However, Harkness' study (1977) which partials out age, reports significant fine-tuning correlations between Guatemalan nurserymaid speech and child's language.

Snow et al. (1976) and Vorster (1976) analysed the speech of Dutch mothers to their children and found that child-directed speech is modified in essentially a similar manner to the English data. Blount and Padgug (n.d.) report that apart from a few parental speech differences between English and Spanish, parents in both languages exhibit similar prosodic and discourse features.

In fact, Ferguson (1977) presented a collation of phonological and lexical modification at the word level (Baby-Talk) across several cultures; he argued that such modifications involved procedures common to all languages. Although many attestations were based on direct elicitation and/or introspection or gleanings from dictionaries and do not exactly comply with the quantitative framework of motherese research, they nevertheless demonstrate that in all cultures and in all languages there are specialized forms of speech addressed to children: in Palestinian and Syrian Arabic (Ferguson, 1956), Berber (Bynon 1968, 1977), Cocopa (Crawford, 1970), Comanche (Casagrande, 1948), English (Ferguson, 1964), Gilyak (Austerlitz, 1956), Greek (Drachman, 1973), Hidatsa (Voegelin and Robinett, 1954), Japanese (Fischer, 1970; Chew, 1969), Kannada (Bhat, 1967), Latvian (Ruke-Dravina, 1961), Maltese (Cassar-Pullicino, 1957), Marathi (Kelkar, 1964), Romanian (Avram,

1967) and Spanish (Ferguson, 1964). Ruke-Dravina (1977) presented examples of baby-talk in the speech of Lithuanian, Polish and Russian speaking families. Meiller (1921) made remarks on French baby-talk and Omar (1973) quoted some words in the speech of mothers in an Egyptian village, while Williamson (1979) studied the nature and distribution of Tamil baby-talk.

III. B. Socio-Economic Research:

Little research has been carried out to investigate the effect of the socio-economic variable on speakers' modification. Ringler (1973) analyzed the speech of 10 Black American working-class mothers and reported that her subjects were adjusting to their children's abilities. (A different opinion was presented in II.1.d. and II.2.a. in relation to Ringler's data.) Holzman (1974) (quoted in Bard, 1980) compared Brown's (1973) middle-class transcripts with Bullowa et al.'s (1964) lower-class samples and found no social class, age or sex differences between the two corpora.

Snow et al. (1976) analyzed the speech of six Dutch mothers who fell into three social classes; middle, lower middle and working class in two settings: reading a picture book and in free play. Only six out of thirty-four measures yielded significant differences for the class variable and then only in the free-play condition. Although the socio-economic factor is not well researched, the existing reports seem to suggest that mothers across social classes adjust their speech to their children in essentially the same manner.

III. C. Non-mother Speakers

This section investigates whether the attributes of the adult have any role in creating the motherese phenomenon and seeks to discover if the special input features are in a more general sense the characteristic of adult language in response to linguistically naive listeners. The relevant research gleans evidence for the above by reviewing the literature on fathers' speech, non-parents' speech and adult speech to other non-competent adult speakers (foreigners).

III. C. 1. Speech of Fathers

Whereas most researchers report that the sex of the speaker does not affect the creation of motherese, it seems that the nature of the task affects the male or female speaker, at least as much as the nature of the child listener. The first work on fathers' speech to their 3-month-olds found that fathers hardly speak to their children; an average of only 37.7 seconds a day represents fathers' vocalizations (Rebelsky and Hanks, 1971). A higher average comes from Friedlander, Jacobs, Davis and Wetstone's (1972) study. The natural home language environment of 2 one-year-old infants was recorded for a week by means of a time-sampling tape recorder with a voice-activated microphone. The distribution of utterances directed to children by the father in each family was comparable: 30% from Mr.Smith and 37% from Mr. Jones. The mothers, on the other hand, were more active: Mrs. Smith 65% and Mrs. Jones 59% and both mothers filled all the categories of analysis more than the fathers.

At any rate, on one category of analysis (imitation) there was a total mirror image for the behaviour of the sexes. Mr. Jones produced 35.0% and Mrs. Smith 35.9%, thus showing that features of fathers' speech can be very similar to that of mothers.

Gleason (1975) reported on a study by Stein comparing the stories which females and males in five families made up for their pre-school children in response to a picture book. In storytelling, fathers' and mothers' speech were comparable in mlu, mean preverb length, repetitions and expansions. There were a number of differences as well. Gleason reported that fathers' mlu was less closely tied to the child than was that of the mothers (neither figures nor statistics are provided); fathers also used significantly more imperative sentences than did mothers. In contrast to fathers' direct imperatives, mothers were more tentative and couched their imperatives in question forms which, in Gleason's view, is a feature of women's language in western society. Together with Blount's sociolinguistic view, the distribution of sentence types seems more tied with the attitude and role of the adult speaker than with tutorial objectives.

Another difference was fathers' use of pejorative names ('dingaling' and 'nut-cake'), fairly rare lexical items[6] (e.g. 'aggravating'), whereas mothers produced significantly more speaker changes (or turns), exclamations and questions. According to Gleason, features differentiating fathers' from mothers' speech stem from the different role fathers play in the 'traditional' family: predominantly that of a disciplinarian[7]. Whereas the language of

fathers at home has the same basic syntactic features as motherese, it is distinguished from it only along the lines of Gleason's view of the father's role 'both as an authority figure and as one who is not called upon to be completely sensitive to the needs and intentions of the child' (p.295). Not being well-tuned to children's subtle signals represents, in Gleason's opinion, a good explanation for Brown's (1973) speculation that children do not have to bother learning the adult linguistic system since mothers understand them and are very attentive to their needs. She argues that children have to learn to talk to their fathers and to other strangers who are less tuned than their mothers, so that children are motivated to exert themselves to be heard and understood by their fathers. In other words, fathers play a complementary role to mothers 'in bridging the gap to the outside world' (p.293).

Engle (1978) carried home recordings of the speech of 4 couples to their 22- to 25-month-old boys and 4 other couples to their 37- to 43-month-old male children in two situations: a free play with toys provided by the experimenter and a modified free play or directed interaction where the parents helped the child put a puzzle together. (Notice that the two situations are not sufficiently distinguished from each other, both being free play; and yet speech varied according to the situations.) Over all the parameters there were only two results for sex differences: mothers significantly increased their mlu to 3-year-olds and fathers used significantly more stock expressions to the older children. Indeed, most of paternal speech means fell between the means of maternal speech for the two age groups, suggesting, perhaps, the assignment of a less

tuned role to fathers as Gleason had suggested. What is interesting in Engle's study, although she does not comment on it, is the situational variable which yielded more significant effects than the sex variable. Parents asked fewer questions and more imperatives in the modified free play and parents of 2-year-olds used fewer deictic statements in the same task condition. Fathers also used significantly more stock expressions in free play than in directed interaction. The evidence, then, suggests that parents (including fathers) react differently to both the context of interaction and to their social roles.

Whereas Rondal's (1980) study yielded results for the sex and situation variables, as with other researchers he chose to discuss the conflicting results of the sex factor adjustments and their didactic value. He recorded the speech of 5 Belgian-French speaking couples to their only male children who ranged in age from 18 to 36 months. The verbal interaction was at home in three speech situations: free play (using the child's own toys), storytelling (using picture books as stimuli) and the family meal which was the only situation at which both parents were present with the child. Unlike Engle's study, there were a number of sex differences in both types of inputs. Fathers produced fewer words during the session, had higher TTRs, lower mlus, fewer declarative statements, fewer joint and indirect requests for action, and more attentional utterances; they corrected children's utterances less frequently and produced more requests for clarification than did mothers. Contrary to Gleason's hypothesis, there was no clear indiction that fathers' language differed from that of mothers, as might be expected from

the authority figure in the family. Fathers did not produce more imperatives than mothers (except in the storytelling session) and used no pejorative words. Rondal interprets this difference as resulting from the organizational status of families where both parents are employed. On the other hand, some results support Gleason's observation that fathers are not finely-tuned to their children; fathers make more requests for clarification than mothers, and children exert more effort in talking to their fathers, as shown by the children's higher mlus to their fathers than to their mothers.

Whereas 4 out of 8 significant effects for the sex factor are of weak order ($p=0.05$), the 8 significant effects for the situational variable are all very high ($p=0.001$). We would not expect such results had Cross' fine-tuning hypothesis or Newport's multifactor explanation been precise. Rather, both parents behaved in the situation in a more uniform manner than perhaps their reactions to their listeners. On two parameters only (proportion of yes/no questions and proportion of indirect requests for action) was there a significant interaction for sex and situation suggesting that the context of activities affected the parents differently. It is possible, then, that differences on the sex variable are differential reactions to the situation rather than the result of social roles in the family or indeed the nature of the listener.

Stoneman and Brody (1981) approach a similar conclusion. They audio-recorded the verbal interactions between 18 two-year-olds and their parents during two dyadic sessions, one with each of the

parents alone with the child and one triadic session in which both parents and the child participated. There were significant effects for the parents from dyadic to triadic situation. In the dyadic situation, fathers spoke more to their sons than mothers and mothers spoke more to their daughters than their sons. In triadic situations, fathers deferred speech to the mothers and assumed more of a playmate role. The authors conclude that fathers and mothers interact in a similar manner with their children, but react differently to situations when different numbers of family members are involved.

Horgan and Gullo (1977) come to a re-definition of the term 'fatherese' to mean not the linguistic patterns used by fathers but rather the language used by any inexperienced male or female speaker to children. Their study was designed to test whether the stereotype sex-role affected the speaker, or whether experience with the child-listener was the determining factor of motherese. They posited that if differences between the language of fathers and mothers were due to sex-typing, then socially androgynous persons not tied down to sex roles should produce 'androgynese'. Forty-one undergraduates were classified according to sex roles (out of whom 10 were 'androgynous') and to high or low experience with children; they were asked to present a story from a stimulus book to an imaginary 2-year-old. The results showed no 'androgynese' and no significant differences for sex-typing; rather, the more experienced with children a subject was, the less differentiated his/her speech was from its male or female counterpart. Surprisingly, though, women produced longer utterances than men, which contradicts the

prediction that motherese uses short utterances. It seems that experience with the child listener rather than the sex of the speaker creates motherese. In fact, the authors suggest the use of the term 'parentese' to describe adults' adjustments to children.

III. C. 2. Non-Parents Speech

The literature reports that irrespective of sex or parental affiliation, adults who come in contact with children produce motherese features. Snow (1972) found that non-mothers' speech was more complex and less repetitive than that of experienced mothers; the differences were not significant. Sachs et al.'s study (1976) showed that five adult non-parents altered frequencies in their speech when talking to a 22-month-old child.

Teachers and caretakers also produce comparable data to parental input. Granowsky and Krossner (1970) tape-recorded the conversation of 7 kindergarten teachers in 3 elementary schools, both talking to the experimenter and to their 5- and 6-year-old pupils. Teachers used fewer words per utterance, more fragments and simple sentences, fewer compounds, complex and compound-complex sentences, and lower type-token ration to children than to another adult. The authors point out that such simplified speech may be detrimental to the language development of the child since it would seem to reduce the richness of the verbal environment by approximating the child's own language. In their opinion, a language level close to adult speech would be more appropriate than simplification in the direction of the child. They suggest that middle class mothers whose mlus were

higher than teachers (11.39 and 8.17 words respectively) provided a more sophisticated environment than kindergarten teachers. While the usefulness of a simplified input is not at issue here (see Section V), the very presence of such features endorses the observation that adults speak differently in the presence of children.

Gleason (1975) in a study of two male and two female daycare teachers at a nursery school, reports that apart from more frequent use of imperatives and vocatives, male and female teachers display very similar modifications in their adult speech. That is, sex of the speaker or parenthood has a minimal role on motherese features, and teachers from both sexes are generally more polite than parents (see note 7).

III. C. 3. Adult Speech to Foreigners

Having reported that the attributes of the speaker play a minimal role in creating motherese, we move to review a style of speech which has often been considered similar to motherese, on the basis that both are produced for, and controlled by, the linguistic incompetence of their listeners - the child and the foreigner. (Research into input provided by teachers to second language learners is a recent development of foreigner talk studies and will be reviewed separately in Section IV.) The study of such styles is of theoretical importance in assessing the universality of the process of simplification by native speakers. However, much of the research into speech to foreigners, as with 'baby-talk' studies,

depends on introspective and subjective statement, unlike the methodology followed in motherese research. Nevertheless, notions of fine-tuning to linguistic abilities are at the centre of such research.

The presence of modifications from Standard English leads Ferguson (1971) to hypothesize that 'speech communities have registers of a special kind for use with people who are regarded for one reason or another as unable to readily understand the normal speech of the community' (p.3); that is, babies, foreigners and second language learners. Ferguson (1975) proposed that Foreigner Talk (hereafter FT) of the 'me Tarzan - you Jane' type is within the ability of the native speaker of a language to produce and respond to under appropriate conditions. Such conditions are to be found in reporting or identifying the speech of foreigners (he refers to C.S. Lewis, but see also Corder, 1975), or in reporting or identifying children's speech. Ferguson elicited FT versions of 10 Standard English sentences from 17 students in one class and repeated the exercise with 19 others in another. He identified three categories of characteristics which have become a much cited framework:

1. Phonology:

FT was slow and low with distinct and exaggerated pronunciation. There were pauses and emphatic stresses. It displayed occasional addition of vowels to final consonants (Talkee/talkie,, workee/works) or reduplicated forms (see! see!, bang-bang).

2. Syntax:

FT included omissions, expansions (addition of material not normally present), replacement and rearrangement:

a. omissions: deletion of obligatory constitutents which reduces the length of sentences such as:
   i. articles 'the', 'a' and prepositions.
   ii. all forms of verb 'to be'.
   iii. all inflectional suffixes or internal stems signalling grammatical categories of case, person, tense and number.
   iv. co-ordinating and subordinating conjunctions.
   v. subject pronouns.

b. expansions:
   i. addition of subject pronoun in imperative constructions.
   ii. addition of unanalyzed or immature tag questions (OK?, right?).

c. replacement/rearrangement:
   i. replacement of all negative constructions by 'no' preceding the negated item.
   ii. rearrangement of possessive pronoun by a pronominal form after the noun ('sister me' for my sister).
   iii. substitution of nominative pronouns by accusative forms. The general view was that pronouns were problematic and should be accompanied by gestures.
   iv. replacement of inverted subject and auxiliary or dummy auxiliary in yes/no question forms by interrogative intonation (your brother?).

3. Semantics:

i. the use of special and restricted vocabulary ('savvy' for understand; 'bang-bang' for gun) and sometimes the use of non-English words.

ii. the 'decomposition' or analytic paraphrase of words ('which place' for where; 'all the time' for always, etc.).

Although FT shares a number of features with motherese, there are also a number of differences which make FT ungrammatical in structure and closer to pidgin. These differences include the omission of all forms of the copula, substitution of nominative pronouns for accusative ones and substitution of all negative constructions with the negative particle 'no'.

Ferguson's indirect elicitation was corroborated for German, French and Finnish studies (Meisel, 1977) and English (McCurdy, 1980), as was his report on ungrammatical sentences. Snow, Van Eden and Muysken (in press) recorded the conversations of 5 native speakers (NS hereafter) of Dutch with 28 foreigners in 2 government offices. Snow et al. report that NS produce Dutch FT similar to Ferguson's list for English. In accordance with their interpretation of motherese characteristics, Snow et al. believe that Dutch FT features are 'helpful' to the foreign listener. The authors also report a percentage of ungrammatical utterances in individual conversations ranging from zero to 37.8, while each of the 5 NSs displayed a variant range of between 2.2 and 20.1%. (See also Clyn (1977) for an analysis of Australian foremen's speech to migrant workers and the Heidelberger Forschungsprojekt 'Pidgin

Deutsch' (1978) for German speakers.)

However, not all workers found ungrammatical sentences in FT. Freed (1978) who carried out the first quantitative study of NS speech to non-native speakers (NSS hereafter) reported that: 'Foreigner Talk is basically plain ordinary English' with not one single ungrammatical utterance (0.00) just like the speech of NS to the experimenter (0.00) and indeed the speech of mothers to their children in Newport's study' (p.235). Long (1981) duplicated Freed's findings. Taken together, these systematic studies support Labov's (1970) statement that the ungrammaticality of everyday speech is a myth.

Nevertheless, previous reports of ungrammaticality raise the question of whether such deviant structures were more related to the minimal proficiency level of the foreigners concerned (as with Ferguson, 1975; Meisel, 1977), or to their lower social status which made for condescending speech on behalf of NSs and/or the pressures of communication with NNSs (as with Heidelberger Forschungsprojekt, 1975; Clyne, 1977). Alternatively, since 'baby-talk' is sometimes thought of as an imitation of the child's own language (Brown, 1977; Kelkar, 1964 and other anthopological studies), ungrammatical utterances could be a way of bridging the gap of linguistic differences to imitate the foreigner's own style (as in Katz's study 1977 of the five-and-a-half-year-old American girl, Lisa, talking to her age peer, Hebrew-speaking Tamar). Finally, previous reports of ungrammaticality could reflect the process of pidginization (Ferguson 1971, 1975; Krashen, 1981). At any rate, Long's

suggestion that the term FT is applied only to ungrammatical speech occurring under specific circumstances, is a sound point. (Long offers the term 'foreigner register' to qualify speech to foreigners, although many researchers still use the ambiguous FT term which may or may not include ungrammatical utterances.) Indeed, Freed points out that it is in the sense of 'a change in the relative frequencies and use of various forms in English that Foreigner Talk is spoken of as a register of English rather than a dialect' (p.236). Arthur, Weiner, Culver, Lee and Thomas (1980) provide the first sociolinguistic distinction between the use of 'foreigner register' and 'foreigner talk'.

Researchers of input to foreigners and second language learners have always held a fine-tuning position. They have assumed, on the basis of introspection, that speech to children and speech to foreigners are both 'simple/simplified registers' produced to assist the language and comprehension of the linguistically incompetent listener (Ferguson, 1971, 1975; Corder, 1975, 1979; Krashen, 1981). To date, one study (Freed, 1978) has set out to test just how similar the two styles are. (Freed's study will be discussed below.) Ferguson (1977) provides a classification of the types of processes involved in producing such registers. The simplifying type includes replacing difficult consonants with easy ones. (Ferguson considers any consonant replacement as easier than the original - presumably more difficult - consonant.) The clarifying type includes speaking slowly, clearly and with many repetitions, whereas the expressive type, mostly restricted for baby-talk uses, includes hypocoristic affixes, euphemisms and nursery tone.

Brown (1977), on the other hand, collapses Ferguson's first and second types into the communicative-clarification component (COMM) and renames the third type expressive-affective component of the register (AFF). Brown postulates that either component can be extended according to the appropriate characteristics of the recipient. According to him, an AFF component is extended to those that inspire affection (lovers, pets and plants), whereas COMM is extended to those who inspire linguistic incompetence (foreigners or second language learners). The recipient who combines both characteristics will receive, according to Brown, the two-dimensional COMM-AFF register; this recipient is the child. In his view these components control the differences between A/A and A/C or motherese. A child and a foreigner will therefore have an input similar in its syntactic profile, since both will receive the COMM component extended for communication, understanding and teaching. Moreover, since pets or plants lack any linguistic level, input to them will be syntactically different from that to a child, although both inputs will share the AFF component in Brown's hypothesis.

Brown's neat two-dimensional classification is not substantiated, however, by the subsequent research of Freed and Hirsh-Pasek and Treiman (1982). Although Freed's foreign subjects were of varied language abilities and of varied language backgrounds, her design provided a more objective test on the fine-tuning hypothesis than did previous introspective interpretations. However, her results, rather than her conclusions, do not confirm the hypothesis. Freed taped the conversations of 11

NSs and NNSs paired together by a conversational partner programme for undergraduate students at Pennsylvania University. She obtained a baseline of native speech by recording NSs talking to herself. Freed proposed that if the inferior social status of the listener controls the style of speech directed to him (an issue raised by Blount (1972) and discussed in this chapter, III.A.), then adults' speech to adult foreigners of the same social status and cognitive abilities should be similar. If, on the other hand, the linguistic abilities of the adult listener play a role in adults' adjustments, then speech to the linguistically incompetent foreigners should resemble speech to children. Freed compared her results to those of Newport (1976).

The finding of differences between NSs and NNSs styles endorses Freed's reference to foreigners' input as a 'register' (above); that is, a variety according to use (Halliday, McIntosh and Strevens, 1964) rather than a 'dialect' or variety according to user (Hudson, 1980). In comparison to NSs speech, speech to NNSs was significantly different; in many ways, the differences resemble those found between A/A and A/C (see particularly II.2.). Foreigner register had significantly more fragments and stock expressions, was significantly less complex in terms of mlu in words and S-nodes, and had significantly fewer declaratives and more interrogatives than the speech of native speakers to the experimenter. Similarly, speech to NNSs resembled Newport's data for speech to children, although no inferential statistics were provided. Depending only on the means, Freed argued that both styles were well articulated and well-formed: 4% unanalyzable utterances and 60% grammatical

sentences for children, and 2% and 56% respectively for adult foreigners. Both styles were also characterized by brevity: 19% stock expressions and 27% fragments for children, and 16% and 17% respectively for foreigners.

However, there were differences which do not support the argument that the linguistic abilities of the listeners (children or adult foreigners) control the nature of speech directed to them. On the syntactic level, speech to foreigners was more complex than speech to children : 4.24 mlu and 82% sentences with one verb in motherese, whereas mlu in speech to foreigners was 8.13 words, and 66% of their sentences contained one verb. Moreover, surface structure distribution was different for both types of listeners; a difference not expected had a syntax-teaching bias been a valid hypothesis. In Newport's sample, children received 30% declaratives, 44% interrogatives and 18% imperatives. In Freed's findings, foreigners received 68% declaratives, 25% interrogatives and 3% imperatives. Her figures, rather than her conclusions, suggest that the cognitive status of the adult foreigner is at issue rather than his linguistic abilities, otherwise the syntactic complexity and sentence distribution would have been similar to that of the child. In other words, Brown's hypothesis is not proven.

While Freed is reported (Long, 1981; Krashen, 1981) to have provided evidence of fine-tuning, this position is not substantiated. As her 11 foreign subjects were of varied language proficiency, she classified them into 'high' and 'low' groups according to the mlu of 25 utterances from each one of them. Freed

carried out t-tests on syntactic and sentence distribution for native speech to the high and low groups. She herself reported that 'there were no significant differences between FT to foreigners with little English proficiency and FT to foreigners with good English' (p.95). She also carried out rank-order correlations on the second NSs and NNSs meeting. Only 2 interrelated parameters (S-nodes/sentence, S-nodes/utterances) out of 15 showed significant correlations for the differences between native speech to low and high English proficiency. On the face of insufficient and contradictory results (2 out of 2 different tests), Freed concludes that 'NS adjust specifically to the linguistic difficiencies of the foreign listener' (p.108). Such a result, however, is too ambiguous to constitute and be quoted as any sort of evidence for the theory.

A final set of results which contradicts the fine-tuning or the two-dimensional position is the absence of change in input features to foreigners over time. Freed repeated the interviews between the 11 pairs after 10 days for the following reason: '....pretheoretical notions of speech among strangers would suggest that first meeting corpora might contain some idiosyncratic properties' (p.96). She computed t-tests of differences between the two meetings. Three out of twenty-four computations reached significant levels. Wh-questions decreased significantly whereas sentence/utterance and stock expressions increased significantly at the second meeting. Although three significant results from one test are stronger than two interrelated ones from two different tests (above), Freed this time chooses to discount these three results. (This decision, however inconsistent with her previous focus on only two results in

arguing for a fine-tuning position, is more acceptable, as the three significant results could be dependent on increased familiarity.) Twenty-one results show that input features do not change over time, despite the fact that Freed reports improvement in her subjects' proficiency. Freed quite rightly concludes that this finding supports her definition of input as a register rather than a dialect. However, this conclusion seriously conflicts with the concept of a fine-tuning theory in which input features should 'systematically' change over time to accommodate changes in the listener. In other words, to support a definition of register, input features should remain constant over time; and yet, the absence of change over time diverges from the conceptual framework of the fine-tuning or even the two-dimensional position.

Another study which gravely damages Brown's two-dimensional register and seriously calls into question the fine-tuning theory is that of Hirsh-Pasek and Treiman (1982). They recorded the speech of four women to their dogs during a number of different tasks. On all measures employed, the authors found statistically significant differences between the speech of women to the experimenter and speech to dogs (which they called 'doggerel'). Surprisingly, the syntactic profile of doggerel came very close to that of motherese : mlus average 3.59 words, 95.7% of sentences contained one verb and one proposition, 89.1% of the verbs were in the present tense and imperatives and interrogatives were evidenced more than declaratives. Even discourse functions of repetitions (exact, partial), of sequential and non-sequential imitation of dogs existed in doggerel. Coincidentally, the value for repetitions to dogs was

23% - identical to the value for maternal repetitions to children in Newport's data. The only difference discovered between doggerel and motherese was in the absence of deictic utterances in the former. These results are contrary to all expectations. Had Brown's hypothesis been valid, doggerel should not have reflected any of the features of the COMM component (syntactic simplification, etc.) of the motherese corpus. Rather, doggerel should only have exhibited the AFF component. Moreover, had the fine-tuning theory been correct, there should not have been instances of duplicated results between doggerel and motherese since dogs lack any linguistic level to control adults' adjustments. Furthermore, the differences between adult to adult speech and adult to child speech which are also replicated between the former and doggerel cannot, in any possible way, be construed to arise from a syntax-teaching function as the fine-tuning position claims.

In short, then, evidence gleaned from various studies of language input does not lend support to the fine-tuning view of adults' speech adjustments. We shall now turn to yet another source of possible light from research into the linguistic environment of second language learners.

IV. Teachers' Speech to Second Language Learners:

Chomsky (1965) specifically stated that second language learners, as with children, experience linguistic deprivation, since their environment is both indifferent and confusing for rule abstraction. The studies reviewed in section II set out to prove

that such assumptions were unfounded as far as the environment of children was concerned. This section reports on similar attempts related to second language learners. While research in this area lacks the experimental rigidity and substantiated results of reports in first language acquisition, it nevertheless follows the general thrust of motherese studies. In fact, researchers argue that teachers use linguistically 'simpler' language when addressing NNSs in a classroom, and that the degree of linguistic simplicity reflects the linguistic proficiency of the class. In other words, what these studies attempt to do is to provide evidence for a stage-dependent type of adjustment, as predicted by the fine-tuning hypothesis. It is therefore for this specific reason that classroom studies are being reviewed.

However, much of the difficulty within this area is that its research aims are not clearly defined and, in turn, its designs do not always have the necessary experimental controls (such as systematic data collection, comparable samples of speech in terms of similar topics, equal number of subjects or of recording duration or a baseline of speech between native speakers for comparative purposes). Some studies also lack quantitative documentation and/or inferential analysis, which, together with the limitations mentioned above, make for a great deal of inter-study variability and a general lack of replication.

In a manner similar to motherese research, the characteristics of input to second language learners in classroom situations have been described on three levels of analysis. Below is a review of

the attempts to establish a specific input adjusted to the linguistic needs of the naive listeners.

IV. 1. Physical Features

IV. 1. a. Rate of speech

Henzl's study (1974) was the first to present a non-impressionistic description of teachers' style (Czech speaking) to American students. Her subsequent studies (1975, 1979) were further elaborations. Henzl (1975) had 11 NSs experienced language teachers (5 of Czech, 3 of German and 3 of English) tell two stories based on pictures. The first set of pictures represented a contemporary political anecdote which invited an extensive use of dialogue, whereas the second represented a short description of an event in the street. Henzl provided the correct control; each subject told each story three times: once to a class of beginners, once to advanced students and once outside the classroom to another adult native speaker of the language. In comparison to NSs speech, speech to NNSs was louder and slower, with frequent pauses at constituent boundaries and with distinct patterns of word segmentation. There was also a contrast between the clearly articulated phrases for NNSs and the contracted forms to NSs. Unfortunately Henzl attached no statistical significance to any of the values reported.

However, the individual values for each teacher at each level do not substantiate the hypothesis that the linguistic proficiency of

the listeners controls the level of adjustments produced to them. In fact, the behaviour of the English-speaking teachers to their class of beginners provides an example. In task 1, teacher 7 produced 56.0 words per minute, whereas teacher 8 produced for the same task and the same beginners' class 179.1 words per minute. If teachers were adjusting their rate of speech to their students' stages, we would not expect a huge difference of 123.1 words to the same listeners from one speaker to another. Rather, individual teacher variation would have been confined to a range prescribed by the abilities of the same addressee. (A similar point was made in this Chapter, II.1.d. concerning the fluctuations in maternal speech rates.)

As with results for maternal speech rates (II.1.d.), Henzl's findings seem to have been affected by the 'dead time' or intrinsic discourse factor. She remarks that teachers tended to wait for 'some reassuring sign of comprehension from their students' (p.8). Consequently, if the waiting time is not subtracted from the overall speaking time, the values obtained would denote something other than duration of individual syllables or words in an utterance. It would most certainly include the waiting time for a reassuring sign to be forthcoming and/or the subjective speaker's judgment of whether or not a signal was reassuring. In other words, Henzl's statement affirms the role of an intrinsic discourse factor previously discussed.

Although the experiments of Arthur et al. (1980) and Wenk (1981) are not classroom studies, they are quoted here for their reliable

results on this parameter. Arthur et al. had 6 NSs and 6 NNSs each call 12 airline ticket agents with a scripted and rehearsed dialogue save for one question. The ticket agent's response to that one identical question (What kind of plane is a 747?) asked by each caller was analysed. The results for words per minute contradict Hatch et al.'s (1975) impressionistic remarks and Henzl's reports. There was no statistically significant difference in speech rate used by ticket agents for NSs and NNSs (mean to NSs 138.83 words and to NNSs 130.27 words). Surprisingly, when questioned, virtually all ticket agents thought that they spoke more slowly when addressing NNS.

A similar phoning design was simulated in the laboratory by Wenk with the difference that his NNSs were of four distinctly different linguistic levels. The experiment focused on the duration of the voiceless period between the release of fortis English plosives and the onset of voicing for the following (stressed) vowels. Comparisons of mean voice onset time for various CV sequences as a function of the listener's competence revealed no significant variation in terms of their linguistically distinct levels. That is, the distinct language proficiency of the listeners did not exert any influence on a distinct voice onset time difference.

IV. 2. Syntactical Features

Researchers have used comparable measures to those employed in motherese studies. The same arguments also apply. These parameters presumably tap various sources of complexity; the paucity of such

sources in speech to second language learners contributes to the general simplicity of speech.

IV. 2. a. Words per Sentence

Speech to second language learners is characterized by shorter sentences than speech to native speakers. While most workers report that there are significant differences in length of sentences according to the listeners' stages, their actual results do not support such conclusions.

Gaies (1977) analyzed the speech of eight teacher trainees obtained during verbal interaction with peers and compared it to speech gleaned from various interactions with their students who were in four different levels: Beginner, Upper Beginner, Intermediate and Advanced. Recordings were made at the beginning, middle and end of a 10 week course. Using Hunt's (1970) T-unit measures[8], Gaies found that speech to NNSs was significantly shorter than to NSs (6.19 words and 10.97 words respectively). He also found that words per T-unit increased according to the student's class level: 4.30 for Beginner, 5.75 Upper Beginner, 6.45 Intermediate and 8.26 Advanced. However, multivariate analysis of variance indicated that 'only language used at the Beginner level is statistically significantly different from the rest of the data' (p.6). Despite this quote from Gaies, he himself and many other workers interpret the results as though they were statistically significant according to stages.

Gaies' findings have not been corroborated by Steyaert (1977) who specifically used Gaies' measures. She compared the speech of English second language teachers retelling stories to their students and to other NSs. So, unlike Gaies, Steyaert controlled the topic. On words per T-unit, she found no statistically significant differences between speech addressed to the two types of listeners. That is, speech to NNSs was not significantly shorter than speech to NSs.

Henzl (1975) reports that `the mean length of the sentence decreased progressively with the lesser competence in the language of the listener' (p.7). The raw scores for beginners and for natives across the three languages suggest a large difference between the two levels. Yet, as stated previously, no inferential statistics were provided to demonstrate that these differences are actually reliable. Indeed, some values seem to be either numerically wrong or the product of an ad hoc definition of sentences. In task two, the Czech teacher (No.2) produced a mean of 1.5 words per sentence (w/s hereafter) to beginners, whereas the average length of his sentences to NS was 42.0 words. Similarly, in task two, the English teacher (No.8) produced a mean of 23.6 w/s to beginners, 34.3 words to advanced and a mean of 200.0 w/s to the native speaker. Means such as 1.5 and 200.0 w/s can either be numerical/typing errors or perhaps represent an unclear definition of a sentence as an utterance in Harris' (1951) description (that is, `any stretch of talk, by one person, before and after which there is silence on the part of that person' in Lyons, 1977).

Although Henzl concludes that teachers produce short sentences according to the linguistic levels of their students, analysis of her data suggests a different conclusion. If listeners shape the quality of their linguistic experience we would expect them to do so irrespective of extraneous factors. If we compute the grand mean across individual raw scores provided by Henzl for each English teacher in each task for each level, we get the results tabulated below:

TABLE 2.3 - Means and (standard deviation) of words/sentence for 3 English teachers' speech to 3 levels of listeners.

	Native	Advanced	Beginner
Task 1	20.5	13.0	7.6
	(6.80)	(1.47)	(1.83)
Task 2	103.6	20.7	13.8
	(83.7)	(11.9)	(8.94)

Table 2.3 gives the impression of a progressive decrease in sentence length as Henzl reports. However, it does not demonstrate that the nature of the listeners controls these modulations as the fine-tuning theory predicts. The same beginners receive two different sentence lengths depending on the nature of the task (7.6 and 13.8 w/s). The same pattern is duplicated for advanced students (13.0 and 20.7 w/s) and for native listeners (20.5 and 103.6 w/s). If the level of the listeners exerted an influence on the length of sentences, length would have remained stable irrespective of the tasks listeners and speakers are engaged in. Not only beginner and advanced listeners are subject to upward changes, but also sophisticated native listeners (from 20.5 to 103.6 w/s). Furthermore, contrary to expectations, there is no clear cut distinction between the different levels of the listeners. In task

two, beginners receive a mean of 13.8 w/s which is what advanced students receive in task one (13.0 w/s); in task two, advanced listeners receive an average of 20.7 w/s which is equal to native speakers in task one (20.5 w/s). The instability of sentence length across tasks and the fact that every level is contained in the other cannot be a validation of adults' adjustments to the linguistic stages of their listeners. Similar observations were noted for motherese mlu irregularities in II.2.a. Taken together, then, adjustments in sentence length seem to be affected by the nature of the task rather than directly by the nature of the addressee.

IV. 2. b. Propositional Complexity

Similar to motherese, speech to second language learners has fewer subordinate and co-ordinate clauses than speech to NSs. Researchers have also reiterated the argument first presented by Snow (1972) that a low proportion of embedded sentences reduces the overall complexity. While the majority of studies report differences between NSs and NNSs, not all of them find stage-related ones.

Henzl (1975) found that speech to beginner and advanced learners contained fewer subordinate clauses than speech to NSs. Computing a grand mean for her three English teachers in both tasks, this writer found that there was a tendency for the means to differ from one level to another. Similarly, there was also a slight tendency for a difference to exist according to the task. In task one, beginners received 1.6 subordinate clauses, while in task two, the average was

2.6. Advanced students received 3.6 and 4.0 respectively while native speakers received 6.0 and 5.6 subordinate clauses.

Gaies (1977) found that speech to NNSs contained 1.20 clauses per T-unit in contrast to 1.60 in speech to NSs; the difference is statistically significant. He also reported that there was a trend towards a progressively decreasing complexity from speech to Advanced students (1.38), to Intermediate students (1.24), and to Upper Beginners (1.14). Surprisingly, Beginners received a slightly higher proportion of clauses per T-unit (1.20) than the next stage of Upper Beginners.

Although Steyaert (1977) used the same measures as Gaies, none of her results duplicate his. In storytelling, Steyaert finds no statistically significant differences in complexity measures between speech to NSs and to second language learners. Nor does she find significant differences as a function of the learners' levels.

Finally, Chaudron (1978b) recorded the speech of seven English language teachers in various subject lessons at three levels of instructions and obtained a native speaker baseline. He reported that his findings corroborated Gaies' for NS and NNS differences in simple sentential stuctures as well as for a decreasing complexity level according to the stage of instruction. Chaudron, however, provides neither figures nor inferential statistics.

IV. 2. c. Sundry Syntactic Features

Henzl (1975) observed that teachers addressing beginners demonstrated a preference for present tense, and for indicative and active verb forms. Instances of conditional and passive constructions occurred only in speech to native speakers (Henzl did not provide any figures).

Gaies (1977) found significant differences between speech to NNSs and NSs in all T-unit related measures. Adjectival clauses per 100 T-units were 2.54 to NNS versus 11.59 to NS; adverbial clauses to NNSs were 5.33 and noun clauses were 11.16, whereas NSs received significantly more: 20.27 and 28.54 respectively. Gaies also reported a trend of decreasing complexity according to stages of instruction, although this failed to reach significance.

Chaudron (1978b) observed a trend of decreasing complexity according to students' classes only for adjectival clauses, whereas adverbial and noun clauses were impervious to such variations. He suggested that the tendency for adjectival clauses to vary according to instruction stages could have been brought about by different contents and formats of lessons in the three proficiency levels. Although Chaudron does not elaborate on this suggestion, he seems to indicate that the different lesson contents under which the data was collected, rather than the student's degree of proficiency imposed certain structures.

The only classroom observation which reports ungrammatical instances similar to Ferguson's descriptive FT list is a study by Hatch, Shapiro and Gough (1975). During drill practice teacher G

produced standard English forms to his class of beginners; but during the 'talk sessions' he frequently used non-standard forms characterized by selection of constituents, replacement of all negative constructions by a negative particle and the use of uninflected verb forms. In her 1978 article, Hatch again reports that simplification of structures to the extent of producing ungrammatical sentences seems a more pervasive phenomenon typical of foreign language teachers than she had initially suspected. Although she does not present any quantitative statement, she almost sees this as a commendable adjustment which helps communication (see also Krashen, 1981). (A very similar attitude is taken up by Brown (1977) for the lexical items of 'baby-talk'.)

Hatch's reports pose a serious theoretical question for second language learners. While a child may come in contact with speakers of sub-standard forms, his first language environment offers numerous opportunities for correct forms - as reported in the motherese studies (II.1.f.). The second language learner on the other hand has, in many cases, the model produced to him in the classroom as his sole access to the foreign language. If his sole model offers syntactically deviant structures (for whatever laudable reason), nothing will save a foreign language learner from linguistic deprivation. The issue requires serious consideration.

IV. 3. Discoursal Features

Input to second language learners, as with that to children, has a redundant character. Both styles are characterized by lexical

restrictions, repetitions and elaborations. Although researchers have interpreted such features as geared to the linguistic stages of the learners, the bulk of the results do not necessarily argue for such a position.

IV. 3. a. Type/Token Ratio (TTR hereafter)

As mentioned in II.3.a., a low TTR indicates that a stretch of speech contains a limited vocabulary and/or a limited range of sentence patterns as well as a high proportion of repetitions. Henzl (1975) calculated TTR of verbs used in the two tasks. She reported that teachers tended to use basic structures more consistently in speech directed to listeners of lowest proficiency. Speech to NSs contained more varied verb usage. She concluded (and all researchers quote her) that teachers limited their vocabulary usage and selected simple lexical items to accommodate the linguistically incompetent listeners. But a close inspection of overall means calculated by this writer leads to a different conclusion than that of Henzl. Consider the following table:

TABLE 2.4 - Means and (standard deviation) of TTR for the speech of 3 English teachers to 3 levels of listeners.

	Native	Advanced	Beginner
Task 1	2.3 (1.3)	2.2 (0.5)	2.2 (0.4)
Task 2	1.2 (0.1)	1.3 (0.1)	1.4 (0.1)

If teachers tuned their vocabulary usage to accommodate their listeners we would expect a distinct difference in TTR according to

the distinct levels of the addressees. Moreover, if teachers systematically changed their usage we would expect a decreasing trend in TTRs from NSs to NNSs. Neither of these theoretical predictions is met. TTR has an almost constant value across the three linguistically different levels within each task. The systematic decreasing trend occurs in the opposite direction: from task one to task two for the same addressee at each level. (This is equally true for the other teachers of Czech and German.) Despite the fact that Henzl herself describes the two tasks as two stories and not as two different types of activities as in the motherese studies (free play and storytelling), we still have different TTRs according to the events discussed and not according to the listeners involved. These features are corroborated by results in motherese studies (II.3.a.). Broen (1972) had a higher index for storytelling than for free play although the interaction missed significance. Fraser and Roberts' (1975) study demonstrated a very significant effect for storytelling in comparison to free play. It seems, then, that the nature of the task, rather than the nature of the addressee, controls TTR.

A similar conclusion emerges from an analysis of Chaudron's (1979) work. He describes two types of vocabulary elaboration used by teachers. Explicit elaboration involves 'the extent to which the teacher focuses on the meaning of a word or expression uttered, sometimes interrupting the actual flow of the lesson' (p.7). Implicit elaboration, on the other hand, involves the passing use of synonyms, paraphrases or apposition, without interrupting the flow of the lesson. Although Chaudron argues that vocabulary elaboration

is a function of the proficiency of the learners addressed, he does not use inferential statistics, and reports that it was difficult to compare across the teachers observed due to 'widely different magnitudes of élaborations across classes' (p.7). However, he reports that the highest level of explicit elaboration was in a geography class, whereas the lowest was in a social science one. Variations according to content lessons suggest, therefore, that vocabulary distribution is a function of the teaching situation.

IV. 3. b. Repetitions

Speech to second language learners is characterized by many repetitions. Hatch et al. (1975) reported frequent instances of repetitions in the classroom as an attempt on behalf of the teacher to avoid confusion and to make himself understood. Hatch (1978) pointed out that in general native speakers would use many clarification devices such as self-repetition or recasting their own questions with syntactic substitution from yes/no to wh-question type and vice versa. Gleason (1973) had reported such a device in adult speech to children.

Chaudron (1979) observed that repetitions of teachers' utterances were quite common in the lower levels of learners whereas they were almost absent from native classes. Teachers also frequently used exemplification, description, naming and definition as well as non-verbal means (pointing, acting, drawing) in order to establish what Chaudron called semantic and cognitive relationships between sounds of words and concepts. As with Chaudron's teachers,

Henzl's made frequent use of gestures and facial expressions. Furthermore, Henzl remarked that teachers tied their language to concrete factors by using definite linguistic forms and actual physical objects in communication. In all three languages investigated, teachers addressing beginners refrained from using indefinite pronouns and indefinite adverbs and replaced them by concrete locatives, whereas they did not impose any such restrictions in speech to NSs. The behaviour of teachers is therefore similar to mothers talking about 'here-and-now' events with their children (Brown, 1973; Cross, 1977; Newport et al., 1977) and using exaggerated paralinguistic features (Garnica, 1977; Gleason, 1977).

Although discourse features such as repetition, apposition, paraphrase and the like have been interpreted as beneficial and didactic by workers in both fields, Chaudron takes a different view. He notes that such devices may create difficulties for the learner who has to 'wade through' syntactically rearranged structures to determine the meaning and relations between them. In other words, these supposedly facilitative devices may confuse the naive learner. Newport et al. (1977) reached a more definite position than did Chaudron. They argued that if repetitions served the child's learning purposes, the double-partial correlations between maternal repetitions and the child's language growth should have been positive. Correlations were negative. The authors argued that, in line with a teaching hypothesis, they would have to conclude that 'repetition delays language acquisition, either by narrowing the child's data base or, perhaps, by boring him to tears' (p.143).

IV. 3. c. Exchange or Turn-Taking

While many studies of adult-child speech have been entirely devoted to discourse analysis (Van der Geest, 1977; Dore et al. 1978; French and Maclure, 1981), only a few (Long, 1981; Scarcella and Higa, forthcoming) have approached adult speech to foreigners on this level. Schinke (forthcoming) is the only study which analyses the interactional aspects of teachers' speech to second language learners. Although her NNSs were of varied linguistic abilities, she did not focus on fine differences according to language levels but rather on differences in teachers' interactions between native students and non-native ones; and there were some significant differences. Schinke suggested that such differences may have harmful consequences on the self-esteem of the second language learner and, in turn, on his acquisition. Newport et al. (1977) had also cast doubt on the helpfulness of motherese features (the issue will be discussed in Section V below).

Schinke tape-recorded twelve teachers in four different grades interacting with students of limited English proficiency (LEP, hereafter) and with native English speaking students during content lessons where English was the medium and not the target of instruction. An interaction was defined in terms of Sinclair and Coulthard's (1975) 'exchange' and consisted of turns taken by speakers on the same topic. Directed interactions were those exchanges with a single student, whereas non-directed ones were with many students or the entire class.

The quantity and quality of the linguistic environment of LEP was different from that of non-LEP on a number of measures. In directed interactions, teachers interacted significantly less frequently with LEP (2.5 times per hour) than with native students (4.6 times per hour, p=.005 Man-Whitney U test). However, not all teachers demonstrated the same behaviour, and they seemed to have been affected by the nature of the content lessons (science, mathematics, social studies) which they were teaching. A chi-squared one-sample test for each teacher revealed that only two out of twelve teachers treated the groups significantly differently, five teachers exhibited moderate differences, and the remaining five showed no differential treatment between LEP and non-LEP. Furthermore, LEP received significantly fewer instructional interactions but significantly more managerial ones (directives concerning classroom procedures). Instructional interactions with LEP tended also to be shorter than with native students.

Schinke, quite rightly, points to the overwhelming consequences of her results. If LEP are interacted with half as much as their non-LEP counterpart, if only one-third of those interactions are instructional, and if they also tend to be briefer, then their cumulative effect can be harmful. Such restricted opportunities in verbal interactions may reduce the LEP's interest in content lessons, may diminish his self-esteem, and may ultimately lead to a delay in linguistic and scholastic success. In other words, teachers' differential treatment of their LEP pupils may create, rather than solve, problems.

In short, then, although there were significant differences on a number of parameters between Schinke's LEP and native subjects, the direction of such differences are not as beneficial as one would expect from a fine-tuning view of adults' adjustments to the listeners' linguistic needs. This brings us to the issues discussed in the next section below.

V. The direction of differences in a fine-tuning position

Research reviewed so far (in II, III, IV) has established two tenets which are contrary to Chomsky's assumptions. First, the linguistic experience of language learners does not consist of ordinary adult language. Many quantitative differences have been identified between speech to adults and speech produced in the presence of linguistically naive listeners (first and second language learners). Differences from an A/A baseline comprising a phenomenon called motherese have also been shown to cut through speakers' role, sex, socio-economic and cultural background to the extent that such differences have been viewed by researchers as listener-dependent ones. Indeed, it is even conceivable that Chomsky's argument about uniform grammar acquisition may be related to the uniform attestations that speakers, in general, tend to adjust their language to their listeners. Second, input to learners is not garbled. Research in first and second language revealed that speech is easily segmented into units by frequent pauses, is readily transcribable and is generally grammatically well formed.

The following sections move on to the fundamental issues upon

which the fine-tuning theory rests. The first of these is the role of the speaker's perception of the listener's linguistic sophistication. The second is the notion that the nature of differences from A/A simplifies A/C in some way. Finally, we deal with the observational studies which attempt to find either direct correlations between the linguistic stage of the addressee and the level of motherese directed at him or a direct effect of motherese features on aspects of the learner's language progress. Studies investigating these issues, however, yield results which are not corroborated. The topics discussed in this section will point to the gaps which the present study attempts to fill.

V. A. The importance of the speaker's perception

Chomsky's (1965) hypothesis took an extreme stance by assigning the role of a linguist to the child. In reply, the fine-tuning hypothesis swung to the opposite position and bestowed that same role on the adult speaker. According to the fine-tuning view, features of the environment are carefully circumscribed to provide effective learning models which are systematically upgraded to accommodate the changing needs of the learner. Levelt (1975) summarizes the interpretation of differences from adult to adult speech as:

> an intelligent text presentation: [where] the child is presented with grammatical strings from a miniature language which is systematically expanded as the child's competence grows (p.15).

While most workers are careful to state that adults' behaviour is not intentional, other such as Levelt and Vorster (1975) are not;

they conceive of the behaviour as intentional. Levelt explains maternal behaviour as 'an intelligent text presentation' and a 'systematic' text expansion. Vorster explicitly shifts the onus to mothers by entitling his article 'Mommy Linguist: the case for motherese'. In addition, Moerk (1974) concludes that mothers are very sensitive measuring instruments for the language capacities of their children, systematically adapting their utterances to these changing capacities.

The emphasis thus placed on the mother/speaker poses a number of embarrassing implications. First, the view of the mother as a linguist is as extreme a position as Chomsky's since it assumes an ideal speaker who possesses a consummate knowledge of what constitutes ease or difficulty in her language. Since most mothers are not trained linguists, it might even be argued that this consummate knowledge is innate, i.e. something they are born with. Consequently, the child, too, must have this innate knowledge. Hence, how does this position essentially differ from Chomsky's?

Second, the claim that motherese is systematically and intelligently composed forces workers to conclude, a priori, that speech to children serves a learning purpose, despite the fact that some of its features are psycholinguistically complex (see V. B. below) and would be inappropriate as part of a teaching syllabus (Newport et al. 1977).

The third difficulty with the fine-tuning concept is that it explains the characteristics of motherese wholly in terms of the

speaker's perceptions. The speaker/linguist produces 'grammatical strings from a miniature language' by avoiding sources of complexities, shortening sentences and generally 'tailoring' the model of language to the child's competence. In order to produce rich and effective language models, the speaker must be able to retrieve, at the appropriate time, the linguistic information he has previously omitted. Moreover, he must be able to gauge the child's progress; if the adult moves faster or slower than the abilities of the child, the latter will be at a disadvantage. A linguistic change which is too fast will result in an obscure input, whereas too slow a change may not provide the child with new learning examples. That is, the speaker must, at all times, monitor the knowledge of the child and be able not only to assist him in his next step but initially to know or guess what the next step might be. If the perceptions of the speaker are not closely linked with the grammatical development of his listener, or are simply incorrect, the child runs the constant risk of linguistic deprivation, and the verbal environment is under serious threat of being useless.

Schinke (forthcoming) mentions in a study under preparation, that teachers' perceptions could not be depended upon in the assessment of their students' performance. The few correlational studies (V. C. below) which attempt to find associations betweeen motherese and the addressee's stages do not produce uniform evidence that speaker's perceptions are finely tuned. If the theory is correct, then, the implication that can be drawn from these studies is that the child is at a constant verbal disadvantage and at the

constant mercy of the adult.

Consequently, if we could find a different theory which may account for the differences between A/A and A/C in better terms than the simple-finely-tuned-syntax-teaching one, we would be in a better position to save the child from the inconsistencies of the speaker's perceptions.

V. B. Motherese: a simple syntax-teaching corpus

The formulation of predictions concerning the notion of a simple motherese corpus is riddled with inconsistencies. Most researchers employ the term casually as a post-hoc description of whatever difference in whatever direction the results of their comparison between A/A and A/C point to (see discussion of Furrow et al.'s interpretations in V.C.1.). Consequently, very few studies integrate an objective criterion of what might constitute simplicity in their findings and, in turn, studies do not necessarily corroborate each others' interpretations. The criterion of simplicity adhered to in this study is gleaned from theoretical rather than impressionistic premises and follows the discussion of inconsistencies inherent in the notion of simplicity itself and in its use in previous research.

The notions of simplicity and syntax-teaching function of motherese were brought about by Chomsky's (1965) assertion that 'no special care is taken to teach [language learners] and no special attention given to their progress' (p.201). Chomsky's emphatic

statement led researchers to take the opposite stance: to conclude that differences in A/A and A/C must arise from the need (or intention) of adults to demonstrate special care and attention in guiding the linguistic development of learners. The bulk of work has argued that many of the motherese features exhibit a careful and attentive style, 'syntactically simple' or 'simplified' which can account for the needs of the language learners. Snow (1972) explains the values of the 'special code' directed to children:

> The first value, no doubt intended by the speaker, is to keep his speech simple ... The second value, unintended by the adult, but potentially as important as the first, is that simplified speech is admirably designed to aid children in learning language (p.564).

A similar opinion is held by Furrow, Nelson and Benedict (1979).

> ... mothers adjust their speech in ways which facilitate language growth. We do not intend to imply that mothers have any intent to teach language ... but we suggest that ... motherese is an effective teaching language (p.440).

While most workers hold the view that motherese is a simple corpus finely designed to cater to the learner's needs, and while each of its features has been construed as beneficial to the acquisition of syntax (see II. 1; II. 2; II. 3), Newport (1976) and Newport, Gleitman and Gleitman (1977) point out that the case against Chomsky has not been definitively won. Motherese characteristics may reduce the acquisition load in quantity, but not in quality. The authors indicate that many of the differences between A/A and A/C are not in the direction of what is theoretically expected to represent simplicity. Rather, motherese contains specific structures which are psycholinguistically more complex than those typical of speech to adults. For example,

motherese consists of a large number of non-canonical structures (interrogatives) or a large number of deleted surface structure constituents (as in imperatives, fragments, and verbless utterances), all of which obscure the direct access to deep structure configurations. Furthermore, while motherese is complex in its structural description, its presentation is also complex. It consists of a wide ranging distribution of surface sentence types rather than a narrow selection of structures, presented one at a time, as would be found in a teaching syllabus. Therefore, the authors conclude that motherese does not seem to arise from a teaching function, but rather, from a communicative one since the needs of the language learners alone do not account for some of its complexity of structure and presentation.

The description of speech as 'syntactically simple' or 'simplified' is, to quote Newport et al., 'a very messy notion'. According to Crystal (1980), 'simplification made in one part of the analysis may lead to unexpected consequences, in terms of greater complexity (or cost) elsewhere' so 'its definition and formalisation remain a controversial topic' (p.323). Brown and Bellugi (1964) had initially described mothers' utterances as 'on the whole short and grammatically simple ... in the form of a simplified, repetitive and idealized dialect' (p.136). In Brown's context, 'simple' is defined in terms of brevity which correlates with syntactic simplicity. This is particularly true when the internal hierarchical organization of a sentence is kept to a single noun-phrase, verb-phrase structure rule. As such, a short sentence would make use of a limited number of major constituents and few constituents

in a sentence would amount to a brief sentence easily processed in short-term memory space.

Moreover, simple sentences combine syntactic brevity with psycholinguistic simplicity. According to Fodor, Bever and Garrett (1974), ease of comprehension depends on minimal rearrangement and pre-posing of surface constituents which, in turn, secures the simplest and easiest deep structure recovery. Simple sentences best fit this criterion since they retain in their surface configuration a canonical organization of constituents (SVO) and thus stand in direct correspondence with their deep structure representations. The violation of such an arrangement would increase the complexity of sentences by adding syntactic length and psycholinguistic recovery time. Therefore, embedded constituents and/or their rearrangement would involve a set of structural operations beyond the basic construction and would generally add length and complexity to surface structures.

However, brevity is not necessarily correlated with linguistic or psycholinguistic simplicity despite the fact that the qualification of motherese as a 'simple' corpus rests mainly on the concept of brevity, especially of short mlu. Indeed, brevity and simplicity may run counter to each other. For instance, right branching increases the complexity of the right-hand-side of a tree diagram (Crystal, 1980). An example like 'the book of the wife of the general' amounts to eight words. The left-branching version of this same example (the general's wife's book) is half the size of the original. On sheer physical length, one would have to conclude

that the right-branching version (eight words) is more difficult than the left (four words). However, according to Yngve's hypothesis (quoted in Lyons, 1977a) left branching (or the shorter example in our case) adds psychological complexity, since processing such a structure would take up more short-term memory space than right branching. While Yngve's hypothesis has been questioned by linguists (see Lyons, 1977a), reference to it shows that sheer length may be conducive to, rather than conflicting with, psycholinguistic ease.

The lack of correspondence between brevity and complexity is again reflected in such devices as omissions and deletions. These operate on surface structures reducing their length and thus contributing to their processing simplicity. Yet these operations increase the syntactic complexity of utterances due to the lack in surface structure of a direct access to deep structure representation (Fodor et al., 1974) or in Brown and Hanlon's (1970) criterion of 'cumulative derivational complexity' where complexity increases according to the number of transformational rules involved in deriving one sentence from another. In fact, Newport, Gleitman and Gleitman (1977) quote a number of structural examples which contribute to both processing simplicity and syntactic complexity: omission or reduction of initial constituents as in utterance fragments and phrases, auxiliary and pronoun in some yes/no questions and the subject in imperative sentences. The authors argue that such complex features should not have occurred if indeed A/A and A/C differences arise from a simple syntax-teaching function. In Crystal's (op. cit.) definition, then, 'simplification

made in one part of the analysis may lead to unexpected consequences in terms of complexity elsewhere' (also Corder, 1979).

Deletions may also increase processing complexity. It has been stated (II.2.a.) that both motherese and foreigner talk styles are classified as 'simplified' due to the reduction of grammatical markers within sentences: suffixes or prefixes, restriction in the use of function words as determiners, prepositions, conjunctions, pronouns and quantifiers. It has also been pointed out that researchers and reviewers deemed such operations as beneficial since they contributed to the brevity of sentences. However, Bever (1970), Fodor and Garrett (1967) have argued that listeners have strategies which rely on such clues as function words, affixes and determiners, etc. to help them in the proper segmentation of speech into constituents. If such clues are omitted from the stream of speech, listeners would be confused in the assignment of proper classification of constituent units as well as in the allocation of correct semantic interpretation. As such, input to the learner may be far from being simple.

Not all researchers agree on the interpretation of simplicity. Whereas Newport et al. use a syntactic approach, Cross (1977) looks at it from the standpoint of acquisition, defining it in terms of what Clark and Clark (1977) call 'a fit' between children's operating principles and the linguistic devices to be acquired. In accordance with the idea of 'fit', Cross uses Slobin's (1973) principle that children approach the task of acquisition with various processing strategies one of which is to 'avoid interruption

or rearrangement of linguistic units'. She argues that yes/no questions which delete the fronted auxiliary and subject pronoun (the non-inverted form) are better suited to the child's processing strategies than the fully realized construction. Thus we see that, while deletions add complexity in Newport et al.'s proposal, they add simplicity in Cross' argument.

Not only do contradictions occur between approaches, but also within approaches. While it is commendable that Cross makes use of Slobin's principle, it is unfortunate that it can be applied to only part of her data. Motherese has proportionately more structures that violate the principle than structures that apply to it.

For the purpose of this study we need to find out not only the significant differences, but significant direction to the differences between input to two types of listeners - native and non-native child. If the needs of the language leaner can account for A/A and A/C differences and if these differences are finely adjusted to match the level of the listener, as the fine-tuning position predicts, then we would expect a significantly simpler input to be produced to the less proficient child of the pair. That is, speech to the foreign child in each age pair should have simpler features than speech to the native child. Below are some related predictions based upon gleanings from theoretical premises.

The SVO sentence allows easy recovery of deep structure representation and avoids interruption and rearrangement of linguistic units; as such, it represents an 'ideal' input as well as

a presumably simple 'fit' with the assumed operating principles of the child. Therefore, a simple input to the linguistically less mature child should consist of proportionately more declarative structures than input to the more mature child. Interrogative types which violate both syntactic ease of recovery and operating simplicity for the child should be less frequent in input to the foreigner than that to the native. Structures which have deleted constituents should be proportionately less in speech to the foreigner in comparison to speech to the native. This includes fewer instances of deleted sentence initial constituents as in phrases, fragments of sentences, of questions (e.g. a Vauxhall?) and subject in imperatives, etc. As embedded sentences represent processing and syntactic complexity, sentences to the less sophisticated listener should predominantly be short with single propositions. Furthermore, reference to non-present events as discussed earlier (II.2.d.iii) represents morphological and semantic complexity and should be reduced in a simple input to the foreign child. Finally, if indeed the levels of the listeners control the degree of simplicity produced to them, we would expect input features to each child to be contained within a restricted range and therefore differences between the two inputs might well reach significance. If, on the other hand, neither the direction of differences nor their degree of significance are satisfied, it would then be difficult to argue that a simple input is produced to the less proficient child or that indeed the levels of the listeners can account for the adjustments made to them.

V. C. Correlational Studies

In order to argue that adults'

adjustments can account for the learner's needs, we expect to find a direct relationship between features of the former and aspects of the latter. In order to propose that motherese is a necessary or even a helpful condition to the acquisition process, we need to establish positive associations with the child's language growth. Research which tackles these two lines of investigation will be reviewed to formulate expectations concerning the current study. Unfortunately, findings of previous research are sparse and conflict with one another making the formulation of predictions quite difficult and open to further investigation such as the one carried out in this thesis.

As stated earlier (II, III, IV) there is as yet no convincing data which provide a definite answer to the assumed relationship between motherese features and the child's linguistic level. There is no evidence for the effect of motherese on the child's language progress that is very conclusive either. This, in itself, is somewhat surprising in view of the importance many theorists have attached to A/A and A/C differences and to their vital effect on language growth. If motherese is a corpus finely tuned to the changing needs of the learner, it should be relatively easy to seek evidence for the validity of such a hypothesis. Similarly, if motherese features had a beneficial effect on language growth, it would be relatively easy to produce evidence which ascertains their crucial role.

However, the lack of hard facts may not necessarily be due to the inappropriateness of such proposals. Rather, procedural and

conceptual intricacies involved in the design of our studies may prevent a straight-forward substantiation of motherese claims. The first difficulty lies in the nature of variables and level of description employed in the analysis of adult speech. The variables used are composed of sub-categories which may or may not have an independent behaviour with respect to adult or child language. A variable may have an enhanced relationship only if its definition includes complimentary sub-measures. Similarly, its effect could be inhibited if its composite measures are incompatible. Alternatively, individual sub-variables may have an independent relationship on child language but remain as yet unaccounted for due to a gross or over-refined level of analysis in our procedures. Such intricacies tend to produce uncorroborated results and weaken our conclusions (see also Cross, 1981).

Another difficulty concerns designing studies dependent upon the age of the child as an index of motherese features. Most previous workers (Broen, 1972; Snow, 1972; Phillips, 1973; Longhurst and Stepanich, 1975) based their conclusions on age-related results. Age, however, correlates to varying degrees with physical, linguistic, intellectual and social development. Simple correlations between motherese features and age of the child would not allow conclusions as to which of the sub-variables affects the significance of the correlation. Bard (1980) also points to the danger of accounting for the child's development in terms of a single index such as age or mlu. MLU may fail to capture some sort of linguistic growth which is strongly correlated with certain maternal speech characteristics. Without in-built controls to the

design of studies, findings concerning a fine-tuning hypothesis could be subject to an artifact.

Indeed, Newport, Gleitman and Gleitman (1977) point to the artifact inherent in motherese conclusions about a cause and effect relationship. This third complexity is conceptual and involves the three-way relationship of parental input, child's age and child's rate of linguistic development. Compared with A/A, features of speech to a young child will be at their highest or lowest concentration. As generally occurs in development, children exhibit their most rapid rate of growth at their early ages and linguistic stages. The less mature a child is, the faster the rate of his linguistic development. It would not follow that the highest or lowest concentration of maternal features caused this rapid burst of development. Simple correlations with the child's decelarating curve of development would create artificial relationships. Significant correlations may well be the effect of children's abilities on their mothers' adjustments or the effect of the latter on their children's progress, or neither. To remedy Newport's (1976) uncontrolled design using three groups of children at three different ages (12 - 15 mohths, 18 - 21 months, 24 - 27 months), all the subjects (mother-child pairs) were revisited after six months. Newport et al. used double partialling procedures to remove the effect of the children's ages and linguistic stages on their own development rate and on their maternal input at the first interview. While such procedures exert the proper control to approach cause and effect issues, Cohen and Cohen (1975) do not generally recommend their use with highly-interrelated variables as the size of

correlations may be reduced. The highly inter-correlated variables of the child and their inter-correlated effects on adult speech require more subtle designs than the ones used so far.

Indeed, Furrow, Nelson and Benedict (1979) make this criticism of Newport et al. Their design precisely manipulated the two interrelated factors. Furrow, Nelson and Benedict matched seven children of the same age (18 months) and the same linguistic stage (one-word stage) to study the effect of their mothers' language at time I (18 months) on their children's rate of development at time II (9 months later when children were 27 months old). In their criticism of Newport et al.'s study, the authors raise yet another conceptual problem in the field. They argue that Newport et al.'s statistical treatment assumes that the effects of motherese were similar at all ages and levels of language development and that changes in the use of particular forms were equally likely regardless of a child's age and stage. These points are well taken since the fine-tuning theory originally claims stage-related adjustments.

However, to argue for stage-related effects, as Furrow et al. do, presents a number of difficulties. Following Furrow et al.'s line of thought we perceive some perplexing corollaries. First, studies which present results pooled for children of different ages and stages as in Newport (1976), Cross (1977, 1979), Retherford et al. (1981) should be disregarded on the grounds of incorrect methodology and incorrect statistical procedures. In other words, the fine-tuning theory is not tested since parental speech

fluctuates according to stages, and lumping together different ages and stages may not show precise relationships to stages. This conclusion is acceptable since we have argued all along that, so far, no research has provided a direct test on the fine-tuning concept (see V.C.2.).

The second inference is also confusing since it would hinder research from reaching any valid conclusions about any of its findings. According to a stage-related effect hypothesis, the possibility always exists that features which do not yield any correlational result at a given or current point in time might yield high correlations at a later point. In other words, the hypothesis is a more extreme position than the fine-tuned relationship between mother's input and child's output at specific stages. Rather, the relationship is between input at a specific stage finely-tuned to output at a time in future.

This brings us to the third problem which concerns the timing of such investigation. We would need to know how many days, weeks, months or years should elapse before we retest children for the effect of motherese. One would expect that a stage-related effect hypothesis would have short term and long term effects; in both cases we need to establish a theoretical time concept in order to integrate it in the hypothesis. Furthermore, we need to exert controls to preclude the effect of normal acquisition during any length of time from stage-related effects of motherese. It is tempting to suggest that, in comparison to Newport et al.'s study, Furrow et al.'s increased number of correlations has more to do with

the longer time interval of nine months between interviews (six months in Newport et al.) than with their better experimental design. Furrow et al.'s child subjects were significantly different in their comprehension scores and so it is possible that they covered more learning ground at the end of a long time interval. Obviously, the proposal of time-stage-related effects of motherese requires rigid timing of stages in child's language acquisition.

Finally, this position would give rise to a number of confounded expectations not guided by theoretical or consistent common sensical predictions, but rather by a scattering of incoherent interpretation. In other words, results would not support predictions and would lead to ad-hoc explanations. Indeed, some of Furrow et al.'s findings give a foretaste of such converse interpretations.

V. C. 1. Cause and Effect correlations

The scattered correlational results under progress studies conflict with one another, their predicted directions disconfirm one another, and in turn, their interpretations are incoherent. Furrow et al. work out a list of predictions for motherese effects based on their findings. Features which yield positive correlations (not necessarily significant ones) with aspects of the child's growth are interpreted post-hoc to represent a simple input conducive to language progress. According to the analysis, fragments and interjections yield a significant positive correlation and hence must have a facilitative effect on the aspect of child language they correlate with. However, such a significant result is embarrassing due to the incoherence of its correlation. Fragments and interjections are themselves verbless

utterances, but they correlate with the increase of verbs in the child's utterances and therefore are to be considered productive to the development of verbs in the child's language. Nevertheless, Furrow et al. argue that the brevity of fragments and interjections constitutes a simple stimulus which has beneficial effects on acquisition. By the same token, then, we would expect brief utterances or low mlus to have the same positive prediction. They do not. The authors mark the predicted sign negative because the results produce significant negative correlations with linguistic measures. And yet the criterion of brevity applies to both fragments and short utterances.

Another set of awkward findings concerns the absence of constituents. Contractions yield negative correlations with the child's measures and out of these, one is significant. The authors argue that contractions hinder language development because they 'add complexity to the surface structure and may also indicate absence of phonological clarity' (p.438). Pronouns also significantly hinder language development due to the absence of semantic and syntactic clarity. Such absence represents a source of complexity. By the same logic, then, the absence of phonological, syntactical and semantic information in deleted frontal auxiliary yes/no questions (e.g. no balls?) should certainly inhibit language progress. According to Furrow et al., it does not. The absence in this case is interpreted as conducive to the child's progress since the category demonstrated positive significant correlations with all the child's variables (mlu, verb/utterance, noun phrase/utterance and even auxiliary/verb phrase). That is, the absence of

auxiliary-fronted language examples accelerates all aspects of the child's development and especially his progress in the acquisition of the auxiliary. This is another example of significant results made incoherent by the nature of their correlations and their subsequent interpretations. Even more intriguing is the fact that auxiliary fronted yes/no questions which retain phonological, syntactic and semantic information reflect no significant effect on any of the child's variables. Notwithstanding these converse findings, the authors construe them as 'simple linguistic input...conducive to language growth' (p.438).

The embarrassing contradiction in Furrow et al.'s study occurs when, guided by their correlational analysis, the authors are forced to relegate a counterproductive effect to certain features which are theoretically accepted to be simple. The canonical ordering of sentence constituents and the presence of few sentence nodes are, by any syntactic or psycholinguistic definition of simplicity (see V. B.), indicative of a simple input. They should, in turn, promote the child's language growth and should, therefore, have been allocated a positive sign. On the contrary, the authors mark their predicted sign negative because the results demonstrate insignificant negative correlations.

It seems, then, that Furrow et al.'s table of predictions (Table 6) is not founded on theoretical or statistical inferences; rather, it is based on the assumption that any difference between A/A and A/C in either direction, even if counterproductive, is still a simple and facilitative difference. Had theoretical premises been

adhered to, declaratives, low mlus and few sentence-nodes should have had a positive sign (+) for predictions. Had statistical inferences been adhered to, all the directions marked (<) in A/A should have produced a positive sign (+) in the predictions and not a negative (-) one as in the table. Guided by the positive or negative direction of their correlations, the authors seem to have simply translated any (<) sign between A/A and A/C as a predicted negative (-) one and any (>) sign as a positive one. Having constructed such predictions, the authors then argue that motherese is a 'simple teaching language' on the basis of having obtained signs similar to their predictions. However, the inconsistencies of these predictions and of their formulation weaken the authors' conclusions.

More awkward than the inconsistencies of predictions are the inconsistencies of the effect of motherese. Of all the features investigated, very few seem to accelerate progress and all the remaining characteristics seem to inhibit aspects of the child's language development. Interjections and auxiliary deleted yes/no questions are the only features which yield significant positive correlations with the child's growth whereas the rest of significant correlations are negative or counterproductive. Notwithstanding, the authors conclude that 'motherese is an effective teaching language' (p.440).

Newport et al. (1977) draw just the opposite conclusions from their effect study; they point out that:

> whether mothers speak in long sentences or short ones, restricted or wide-ranging sentence type,

> complex sentences or simpler ones -- none of these plausible candidates for a teaching style have a discernible effect on the child's language growth during the six month internal we investigated (p.136).

The only effect Newport et al.'s study found was on what they called language specific constructions of English. Out of all interrogatives, auxiliary inverted yes/no questions had a significantly high correlation with the increase in the number of auxiliaries in the child's verb phrases. Newport et al. conclude that spotlighting linguistic items at the beginning of sentences fits the child's listening bias. This conclusion clashes with cross-cultural evidence (Slobin, 1973) that children have the strategy of attending to the end of sentences (operating principle A) and hence acquire suffixes before prefixes.

It is worth mentioning that reports on yes/no questions and their sub-classification are difficult to reconcile within the one study as in Furrow et al. or across other studies. In fact, when reports are taken together they do not lead to conclusive statements. If Newport et al.'s variable only accounts for the fully realized auxiliary inverted yes/no questions, then their results and their conclusions are not substantiated by Furrow et al.'s findings for this particular category. Wells (in press) whose design was amended to resemble Furrow et al.'s, does not produce affirmative results to support the single category in either study (although he himself argues otherwise). Wells' table shows that the single variable of auxiliary fronted yes/no questions demonstrate no significant effect on any of the child's progress measures (mlu, verb/utterance, noun/utterance and auxiliary/verb phrase). Wells'

finding for this category corroborates Furrow et al.'s but disconfirms Newport et al.'s. Wells also finds no significant effects for the deleted auxiliary yes/no questions on the four measures of the child's progress which again does not validate Furrow et al.'s powerful findings on those four measures. However, Wells lends limited support to Furrow et al. in finding a significant effect for the deleted auxiliary question type on a difference score obtained by comparing slow and fast developers.

If, on the other hand, Newport et al.'s measure includes both fronted and deleted auxiliary yes/no questions, then the authors are not in a position to conclude, as they do, that sentence initial auxiliary accelerates auxiliary growth since their variable contains two sub-variables which have incompatible linguistic description and converse statistical behaviour on the child's progress. Indeed, while the total yes/no interrogative category in the three studies shows significant correlations with the child's progress in auxiliary, it is likely that the sub-variable of the deleted question type exerts the greatest influence on the total category in view of its individual result. In other words, that the presence of sentence initial auxiliary is effective, is, by no means, conclusive.

Nevertheless, what is gained by inverted yes/no questions -- Newport et al. argue -- is lost by the affirmative imperative construction which has no initial auxiliary and correlates negatively with the child's progress in auxiliaries. While this conclusion seems reasonable, it should be accepted with some

reservation. If affirmative imperatives have a counterproductive effect, we would expect negative imperatives with their limited set of fronted auxiliaries to have a productive effect. Newport et al. do not have a separate classification. The measure, as it stands, suggests that it was made up of two linguistically and statistically incompatible variables.

The second language specific significant correlation found in the study was between the frequency of maternal deixis and the growth of inflections in the child's noun phrases. Surprisingly, deictic utterances showed negative correlations with the child's vocabulary growth. Bard (1980) remarks that the results of the deixis do not sit comfortably with those of the auxiliary fronted interrogatives; the latter point to an influence exerted through initial constituents whereas the former suggest that the influence is through their final noun-phrase constituents.

From the above discussion, it follows, then, that researchers' correlational findings on motherese effects not only fail to confirm one another's evidence, but that each study has a certain number of inherently converse results. Such disperse and inconsistent data inhibits coherent or conclusive statements.

V.C.2. Fine-tuning correlations

Irrespective of the conclusion above (V.C.1), we may still argue that motherese has an effect on language acquisition if we can prove the presence of stage-related adjustments in adult speech to

children. We would, indeed, be able to conclude that differences between A/A and A/C account for and shape the child's linguistic experience. Unfortunately previous fine-tuning studies do not yield compelling evidence, nor do they directly test the linguistic stage of the child. Correlational results produced so far tend to correlate more with the age, rather than with the stage, of the addressee.

The shortcomings of previous fine-tuning attempts (Newport, 1976; Cross, 1977, 1979; Retherford et al., 1981) may be due either to investigating maternal adjustments as a concurrent function of age and language abilities of children and/or to pooling results of groups of children from different ages and stages to compute correlational analysis. In either case, the assumed 'fine' adjustments to linguistic stages or to aspects of these stages may be lost or reduced in pooled results specially when subjects vary in the range of their age and their abilities. That is, certain motherese features may be at their highest concentration at one stage, but at their lowest at another stage, and pooling them together would weaken or cancel out such stage association. Indeed, Furrow et al. make a similar criticism on Newport et al.'s statistical treatment because it assumes that motherese effects are constant at all ages and stages of the child's development. Consequently, then, without an internal control for the important variables, correlations between maternal speech and linguistic measures tend to be low and sparse.

Researchers have resorted to statistical and experimental

techniques to obtain direct association with linguistic stages. With one point in time, Harkness (1977) partialled out the age of the children who ranged from 24 to 42 months. Then she correlated nurserymaid speech with child's language corrected-for-age. Harkness reports significant fine-tuning correlations between the speech of Kenyan nurserymaids and children's mlus and these correlations are the highest in number among all studies of English speaking mothers. However, Harkness increased the number of her significant results by increasing the usual level of five percent chance result to ten percent and amending the significance levels accordingly (***$p<0.01$, **$p<0.05$, *$p<0.10$). Consequently, her low or non-significant correlations become very or highly significant. Such unfounded statistical amendments contribute to misleading conclusions.

With two points in time (3 to 6 months interval), Retherford et al. (1981) used another statistical technique to control for the concurrent age and stage subject design. The authors computed cross-lagged panel correlations between children at time one and mothers at time two to test the presence of a fine-tuned relationship. While Retherford et al. used semantic classifications, only mlu and amount-of-talking ratios showed significant fine-tuning correlations or adjustments on the basis of the child's performance. However, they report that their evidence, in general, does not support a fine-tuning position because the six 'English-speaking mothers did not alter the distribution of semantic and syntactic categories in their speech over time despite changes in occurrence and relative frequency of roles in the child's speech'

(p.605).

Other researchers have used experimental designs. Cross (1978) designed her study 'specifically to control for the effect of the children's linguistic level on their mothers' speech adjustments' and for this very reason she 'used a matched-pair design to control precisely for their individual levels while allowing age and hence rate of acquisition to vary within pairs' (p.202). The children who ranged from 19 to 33 months were matched in pairs according to their mlu values. The younger child was considered 'accelerated' in comparison to the older child because he attained the same linguistic level at an earlier age than the older child; the older child in the pair was assigned to the 'normal' developer group. Cross compared maternal speech to the 'accelerated' and the 'normal' groups arguing that whatever feature is greater for the younger child it is responsible for his accelerated rate of development. But as Bard (1980) points out, Cross' study is subject to the artifact mentioned by Newport et al. (V.C.l.): wherever there is a maternal speech characteristic that decreases with age, the younger child ought to have more of it, and therefore, the study may only reflect the relationship between motherese and age when mlu is held constant. Indeed, Cross' study is neither a progress nor a fine-tuning one since by controlling for the linguistic level of the child in a matched-pair design, she literally removed the influence of the linguistic variable on motherese. In her own words, she allowed age to vary and thereby maximized its already pervasive effect. As Elliot (1981) remarks, Cross' study shows that the relationship between features of a mother's speech and her child's

linguistic development is far from simple or obvious.

Further fine-tuning correlations come from Furrow et al. (1979) and Wells (1980). Furrow et al. removed the effect of age by selecting children of the same age and stage at the beginning of the study to investigate a progress relationship. However, they computed stage-related correlations between maternal speech and child's linguistic variables at 27 months. (Their results will be listed in Table 2.5 below). Wells, on the other hand, uses Cross' design of mlu matching, and with two points in time, he calculates correlations on difference scores. He himself agrees that his results for fine-tuning relations are very indirect.

Summarizing, then, in view of the intricacies in designing direct experimental or statistical tests on the fine-tuning hypothesis and in view of the sparse and divergent results obtained, evidence for the role of the child's linguistic stage on motherese adjustments remains circumstantial. The current study was initially undertaken with the aim of furnishing a more direct investigation of the hypothesis than previous attempts. It is to its predictions that we turn now.

VI. Statement of Research Question and Expectation

The present research varied the linguistic stage of the addressee independently of age attributes. The design matches pairs of children of similar ages but of different language abilities to test the fine-tuning hypothesis. In that sense, the study

manipulated just the opposite variable involved in the studies by Cross (1978) and Wells (1980). To secure that the children's linguistic abilities in English would be indeed different, the design matches three native English-speaking children with three non-native children of the same age. The age-matched-pair design, therefore, naturally removes the effect of age and leaves us to concentrate on the following question: Does the linguistic stage of the addressee control the nature of adjustments produced to him ? A positive answer to this question would be interpreted as evidence for the fine-tuning hypothesis. A negative answer would be difficult to reconcile with that position.

As the current research depends on comparisons between adult speech to the native child and the speech of the same adult to the foreigner, we need to establish predictions of a fine-tuning position concerning the nature of differences between the two inputs. As summarized by Cross (1977) the fine-tuning hypothesis predicts 'a high degree of correlation between mothers' speech features and child ability at all descriptive levels but particularly at the syntactic level' (p.154). Hence, to support the hypothesis we need to find not only significant differences between inputs to the linguistically different children in each pair, but also a significant direction to the nature of differences. That is, the foreign child is expected to receive a (significantly) simpler input than his native control in each age-match-pair. If the direction of difference between the children is in the same direction of our expectations of simplicity (V.B.), then we can confidently state that adjustments to the language learner are

accounted for by his linguistic needs, as the hypothesis predicts. If, on the other hand, differences between inputs to the two listeners violate expectations of simplicity, it would be awkward to argue that the less proficient child of the pair receives a simple corpus such as the fine-tuning position would lead us to expect.

Expectations of what constitutes simplicity were developed according to our best known theoretical descriptions (V.B.). These appear under the column labelled expectations in Table 2.5 (below). According to such expectations, the less mature child should receive shorter and more complete sentences with fewer fragments and interjections than the more mature child. As declaratives represent the simplest structures, there should be proportionately more of these in the input to the foreigner than to the native, whereas there should be proportionately fewer complex structures, such as imperatives and interrogatives. Complexity features should generally occur less frequently to the foreigner than to the native (V.B) with more reference to the here-and-now topics. The various aspects of discourse which are supposed to promote learning are discussed in II. 3 and their direction is listed in Table 2.5. Table 2.5 is constructed in terms of what is predicted to be simple input to the linguistically less proficient child of the pair. In other words, it is founded on the precise and fine-tuned relationship between adult speech parameters and the child's linguistic stages.

Table 2.5 includes the variables investigated in the current research and for which previous studies report significant

fine-tuning correlations. If a study demonstrates significant associations between maternal speech variables and the child's overall stage, as measured by his mlu, the result and its direction vis a vis the foreign child is charted on the table and forms part of the predicted direction of differences between inputs to the more naive member of the pair. In cases where results conflict with each other or with the expectation of simplicity, and where their overall average remains inconclusive, 'C' is assigned to the overall column of predictions. A quick look down that column in Table 2.5 shows that fine-tuning correlations are few and often conflicting. This explains why the present study has been undertaken. In other words, in order to establish that the linguistic stages of the addressee account for the nature of adjustments produced to him, we need to find significant differences between the two linguistically different abilities of the pair members. Futhermore, we need to discover that the direction of the differences is in accordance with the expectations of simplicity. (In Chapter IV, predictions from a theoretical and empirical basis will be further tackled in assessing the results in this thesis.)

Table 2.5 - Summary of fine-tuning predictions of simplicity and of significant correlations with child's mlu gleaned from previous studies

	Adult Speech Parameters	Prediction of Simplicity	Prediction from Literature						
			1	2	3	4	5	6	Overall
Overall	MLU	<	-	-	<	<	-	<	<
	MUT	<	/	/	-	-	<	/	C
	C. Sentence	>	/	/	-	-	/	/	-
	Fragment	<	-	/	-	-	-	/	-
	Interjection	<	-	>	-	-	/	/	C
Surface Sentence Type	Declarative (Total)	>	<	-	-	-	-	-	C
	Declarative	>	/	/	/	/	/	/	/
	Deictic	>	-	/	-	-	/	/	-
	Fragment Decl.	<	/	/	/	/	/	/	/
	Imperative (Total)	<	>	<	-	-	-	-	C
	+ Imperative	<	/	/	-	-	/	/	-
	- Imperative	<	/	/	-	-	/	/	-
	Imperative + Subject	>	/	/	-	/	/	/	-
	Fragment Imperative	<	/	/	/	/	/	/	/

Legend:

< significantly smaller
> significantly greater
- no significant difference
C conflicting results
/ variable not investigated
MLU mean length of utterances
MUT mean number of utterances per turn

1 Newport (1976)
2 Furrow (1979)
3 Cross (1977)
4 Cross (1979)
5 Wells (1980)
6 Harkness (1977)

(cont'd)

Table 2.5 - Summary of fine-tuning predictions of simplicity and of significant correlations with child's mlu gleaned from previous studies

	Adult Speech Parameters	Prediction of Simplicity	Prediction from Literature						
			1	2	3	4	5	6	Overall
Surface Sentence Type	Question (Total)	<	/	/	-	>	/	<	C
	wh-question	<	-	-	>	>	>	/	C
	wh-final	<	/	/	/	/	/	/	/
	Aux. yes/no	<	-	-	-	-	-	/	-
	Raised verb	<	/	-	/	/	/	/	-
	Raised intonation	<	/	-	-	-	/	/	-
	Declarative + tag	<	/	-	/	/	/	/	-
	Tag	<	/	-	-	-	/	/	-
	Fragment Question	<	/	-	/	/	/	/	-
Complexity	Present	>	/	/	/	/	/	/	/
	Past	<	/	/	/	/	/	/	/
	Future	<	/	/	/	/	/	/	/
	Verbless utt.	<	/	/	/	/	/	/	/
	Multi-proposition	<	/	<	/	/	-	<	<
	S/node/sentence	<	-	-	-	-	-	/	-
Discourse	Imitation (Total)	<	-	/	>	>	<	/	C
	Imitation	<	-	/	-	-	/	/	-
	Trans. Imitation	<	<	/	/	/	/	/	<
	Correction (Total)	>	/	/	/	-	/	/	-
	Syntactic	>	/	/	/	/	-	/	-
	Semantic	>	/	/	-	-	<	/	C
	Rephrase	>	/	/	/	/	/	/	/
	Repetition (Total)	>	>	/	>	>	-	-	C
	Repetition	>	-	/	-	>	/	/	C
	Trans. Rep	>	-	/	-	-	/	/	-
	Paraphrase	>	-	/	>	/	/	/	C

Legend:
< significantly smaller
> significantly greater
- no significant difference
C conflicting results
/ variable not investigated
MLU mean length of utterances
MUT mean number of utterances per turn

1 Newport (1976)
2 Furrow (1979)
3 Cross (1977)
4 Cross (1979)
5 Wells (1980)
6 Harkness (1977)

NOTES TO CHAPTER TWO

[1] - Variables for which an adult baseline is provided are reviewed in order to give the reader a full description of the motherese style and its fluctuations. However, not all variables discussed have been used in this study for the simple reason of keeping the task manageable.

[2] - Support for this view comes from Bard (1982) who isolated words from speech addressed to children and adults and measured their duration in milliseconds. She found no significant difference between rates of utterance of the same words directed to the two types of addressees (Personal communication).

[3] - It is not clear how the presence or absence of inflections can affect the length of utterances when mlu is counted in words as in the case of Snow. The argument strictly applies when mlu is counted in morphemes/morphs. Nevertheless, most workers reiterate the reasoning even when their count is in words, e.g. Cross (1977); Gleason and Weintraub (1978).

[4] - In II.1.b., it was noted that Garnica's imperative sentences were classified as raised intonation questions while Sachs et al.'s simple declaratives were counted as questions. Broen, on the other hand, categorized raised intonation questions as imperatives and some single imperative verbs as incomplete sentences.

[5] - It is not clear what kind of relationship the verb may convey among the words since it is initially unmarked for any such relationship.

[6] - In the home environment of the non-native subjects in this project, fathers also used sophisticated Arabic words to their children, whereas mothers typically commented that such words were too difficult for their children's comprehension.

[7] - Such peculiarities are restricted to fathers at home and not to male caretakers. According to Gleason, this observation adds another variable affecting the behaviour of adults whether they are talking to their own children or to other people's.

[8] - Hunt (1970) devised 'the minimal terminal unit' or 'T-unit' to account for the systematic maturity of the written composition of school children. T-unit is defined as 'one main clause plus any subordinate clause or non-clausal structure that is attached or embedded in it' (p.4). The measure and its related ratios are frequently used in second language input studies.

CHAPTER THREE - Material and Methods

I. Purpose of the study

As indicated in Chapter Two, Section V.C., there is, as yet, no direct test on the fine-tuning hypothesis. The hypothesis states that, in their speech to children, adults exhibit quite fine and systematic syntactic adjustments to the particular linguistic levels of their listeners. Such 'tailored' adjustments have also been interpreted as contributing to a reduction in children's learning load. It has been pointed out that previous attempts have not directly tested the validity of this hypothesis due to the methodological difficulties in isolating interrelated variables such as the child's linguistic achievement, chronological and intellectual development. Indeed, the cause of speech modification has not yet been clearly identified and in turn, its possible or potential effect on language acquisition is not yet clearly understood.

This thesis aims at investigating the precise effect of children's linguistic levels on adults' syntactic adjustments over an important period of their language development. It directly tests the fine-tuning hypothesis by controlling the relevant attributes of the listeners. It therefore determines whether the formal changes in adult speech to children are the function of the linguistic stages of the child or a generalized response to his overall development. More specifically, the thesis addresses itself to the factors which give rise to the motherese phenomenon.

II. Design of the study

Brown (1973) points out that 'two children matched according to their linguistic abilities are more likely to have speech that is, on internal grounds, at the same level of constructional complexity than are two children of the same chronological age' (p.77). Conversely, two children of the same chronological age may not have speech that is, on internal grounds, at the same level of constructional complexity. In fact, Cross (1978) had easily been able to find pairs of children at the same linguistic stage, but of different ages.

To ensure that children of the same age were markedly different in their linguistic abilities, the design of this study matched non-native English speaking children, whose parents were also non-native speakers, with monolingual English speaking subjects of similar ages. The six children who took part in the experiment formed three pairs of two-, three- and five-year-olds. The three non-native children were linguistically less proficient pair members while the three native children were their more proficient mates. As the pair members spent their time in the same environment, there was no a priori reason to believe that the two sets of children were different from each other in any respect other than in their language abilities. Consequently, by experimentally manipulating the age factor, the linguistic level of each child was the most plausible potential cause for any adult syntactic modification.

The present design is particularly important for three other related reasons. First, the design provides for repeated sampling of the speech of the same adult native teacher to the native and non-native member of her pair. Having the same adult speaker interact with the two different types of listeners in the age-pair allows an exact assessment of the teacher's ability to adjust the formal features of her speech according to the different proficiency levels of her two listeners.

Second, the longitudinal design genuinely captures the fine incremental adjustments, if any, in adult speech which are predicted to accrue systematically over a period of time. Previous studies sampled speech from groups of mother-child dyads at one time point. While such studies had the advantage of sheer quantity, they were not in a real position to define the quality of a finely-tuned adult-input-child-output relationship. At one observational point, some adults may be more tuned than others while some may simply not perform naturally under experimental conditions. The exact magnitude of fine incremental formal changes may not be captured at one sampling point. Only a longitudinal sampling design such as the one followed in this study may fully explore such a relationship.

Third, previous studies concentrated on group statistics across several mother-child dyads of different child ages. However, pooling results across different adult speakers may weaken the particular syntactic tuning that each speaker may have developed in relation to his listener's needs. After all, each adult may have a

unique step size which he uses to remain ahead of his listener and each listener's needs may elicit diverse response at different times. Consequently, comparing across different speakers and different listeners may create large inter-speaker fluctuations which may fail to support a fine-tuned position. (This issue was dealt with at length in the review of rate of speech and mlu in Chapter Two, Section II.1.d and II.2.a.) The longitudinal design of the current study allowed monthly samples for each of the six children with their three respective teachers over a minimum period of five months. The methodology employed therefore optimizes the likelihood of tapping a precise relationship between children's stages and adults' syntactic changes if indeed there is one.

The design then hopes to achieve the purpose of the study by:

i. removing the effect of age via an age-match design.

ii. separating listeners' linguistic variables from their age by selecting non-native English speaking children who, in comparison to their native English speaking controls, would be linguistically less proficient but cognitively and physically similar to them.

iii. removing fluctuations of groups of speakers by having the same adult speak to each child.

iv. collecting data longitudinally to capture the expected fine adjustments over time.

The resulting data should put us in a position to answer the following research questions:

1. Does the linguistic stage of the listener affect the formal and functional aspects of adult speech?

2. Does the verbal environment of the less proficient child account for his language learning needs?

3. Failing unequivocal answers to the above what other possible cause can account for the presence of the motherese phenomenon?

III. Subjects

The study rests upon the experimental matching between pairs of children at three ages (2, 3 and 5 years) who differ from each other in linguistic proficiency (non-native versus native English speaking children). The non-native children had the same Arabic language background. The annotation F and N will refer to speech produced by individual foreign or native child whereas speech by the teacher to either one will be coded as AF or AN. Age pair 2, 3 and 5 refer to the ages of the three pairs respectively: two-, three- and five-year-olds. Hence AF2 means adult speech to the foreigner in the first age pair of two-year-olds.

III. A. Children Subjects

III. A. 1. Age pair 2

The non-native child, a boy, was born in Edinburgh on September 14, 1976. His Egyptian parents were both preparing for their doctorates at Edinburgh. He was admitted to the University Day Nursery at 12 months and attended it until he was 33 months old. After his first birthday, speech samples at home and at the nursery were collected monthly from the Arabic and English environments. At home, the parents spoke Arabic to their child throughout, but towards the end of the observation period Arabic came to be mixed with English, in which the mother was more fluent than the father. At 23 months, the child was transferred to the second university nursery which has ages up to five years old. On the child's second birthday, the family spent a one month holiday in Cairo. Upon his return the child was producing a few arabic words which eventually disappeared. Observations at the second nursery were resumed; it is this later period which is included in the study.

The native child, whose parents are staff members at Edinburgh University, was born on August 25, 1976. He attended the university day nursery for toddlers from 9 months of age. He was transferred along with the non-native child to the older nursery. Both children were in the same age group at the nursery and got on well together.

A. 2. Age pair 3

The non-native child, again a boy, was born in Edinburgh on March 21, 1976 of Syrian parents. His father carried on doctorate research at the phonetics department of Edinburgh University while

his mother, a university graduate, looked after the child. By December, 1978, the child joined the Social Work department nursery as the mother had started working. Speech samples were collected once a month from both the home and the nursery environment. The father, a fluent speaker of English, spoke more English to his son than did the mother, who did not know the language well. The mother spoke predominantly Arabic to her son who showed an understanding of the language.

The native control was a boy two months older than the non-native child and born on January 12, 1976. He was of a comparable socio-economic class to the non-native child and got on well with him. Observations for this pair lasted for five months and were stopped when the teacher changed her job and the non-native child eventually moved to another nursery school.

III. A. 3. Age pair 5

Unlike the other two subjects, the non-native girl in the third pair was born in Cairo on May 26, 1973. She was left in the care of her grandparents in Cairo until August, 1978 when she joined her parents in Edinburgh. The father was preparing his doctorate in London and would pay periodic visits to Edinburgh where the mother, a university graduate, was working as an accountant at the French Cultural Centre. Both parents spoke Arabic to their child especially with the birth of her brother in September, 1978. In September, when primary school started, the girl, now aged 66 months, joined a state primary school. During the Easter break of

1979, the family went for a month's holiday to Cairo. On their return, they brought back Arabic books for the child as she showed signs of forgetting the language or an unwillingness to speak it.

The native control was a girl who had exactly the same birth date as the foreigner. Her parents were school teachers and had one other child, a three-year-old boy. Both girls joined the primary school at the same time, shared the same working desk and became best friends.

III. B. Adult Subjects

III. B. 1. Teacher One (hereafter T1)

T1 corresponds to age pair 2. She is a young married woman with five years working experience with children and who spoke with an Edinburgh accent. She was working at the toddlers' nursery when the youngest pair was there and had taken part in the recording sessions then. Two months after the children's move to the second nursery, T1 was also transferred. The nursery was divided into two age groups, two years + and three years + and the three adult caretakers would alternate between the groups. In February, 1979, the groups were restructured in such a way that each teacher became responsible for one group which had an equal mix of younger and older children. The age pair remained in T1's group.

III. B. 2. Teacher Two (hereafter T2)

T2 corresponds to age pair 3. She is in her early thirties and had three years experience at the Social Work department nursery. The children were classified according to their age range in that nursery and T2 had the pair in her group. T2's attendance was not regular and the sessions had to be constrained by her availability and by the nursery schedule. T2 left the nursery at the end of June 1979 which led to the termination of observations.

III. B. 3. Teacher Three (hereafter T3)

T3 corresponds to age pair 5. She is an Edinburgh native, in her fifties and had been working as a school teacher for seventeen years. The class as a whole spent most of its time in the care of T3 except during lunch breaks and gym lessons. As it was almost impossible to get enough speech samples between T3 and the pair during class time, a new arrangement had to be made. With T3's co-operation, it was agreed to fix recording appointments either towards the end of the lunch break or during the gym lessons when the classroom would be empty and T3 would interact freely with the pair.

IV. Procedure

IV. A. Material

The speech samples are audio recordings of three teachers and six children in their respective schools. While the presence of an observer with a tape recorder is somewhat bound to influence the

object of investigation, serious efforts were made to reduce the unnaturalness of the intrusion.

IV. A. 1. Hidden apparatus

The apparatus used in the study was a battery operated German Uher 4000 Report L with automatic control level. The tape recorder was put in the investigator's shoulder bag. The very small but highly sensitive microphone head was clipped on to the side of the bag and not particularly obvious. Before entering the room, the investigator (hereafter E) would press three buttons: Start, Record and Pause. This meant that once inside the room all E had to do was to release Pause surreptitiously and the recording would start. There were many instances where the Pause button was not operated and the recording would take place without any sign that it had begun. At all times, the bag was hanging on E's shoulder in such a position that the microphone head would be facing the speaker. This technique allowed maximum mobility for the subjects to move freely in the room and for E to move along with them to ensure that speech was within microphone range. It also enabled E to position herself between the two children and opposite the teacher. Finally, the concealed machine ensured surreptitious samples of speech.

IV. A. 2. Behaviour of E

E regularly visited the schools one to two times before her scheduled recording date. This meant that none of her subjects

knew exactly when they were being recorded. Teachers and administrators were assured that 'no tricks' were going to be used. E did not provide any toys, books or guidance to the teachers save the only instruction of carrying on with what they regularly do with the children. E often participated in the activities of the children and showed equal interest in both subjects of the three pairs. The length of the observations and the relaxed behaviour of E made the teachers accept E as a helper to them while the children accepted her as another teacher. Indeed, the methodology employed resulted in speech samples which can be taken as a very accurate representation of these children's linguistic experience.

IV. B. Duration

The period of data collection extended for seven months for age pairs 2 and 5 and for five months for age pair 3. Recording for each non-native child was carried out once every three or four weeks at the nursery and at home. The home recording in the Arabic environment is irrelevant for this study. The corpus of the present study concentrates only on the English environment of the schools and only the tapes of the English data are tabulated in Appendix A.

IV. C. Transcription

Each page of orthographic transcription was divided down the middle. On the left-hand side, was all the adult speech including that of the experimenter giving descriptions of the setting. On

the right-hand side of the page was the speech of children. This organization led to a successful strategy; first, only adult speech was transcribed with E's descriptions or comments in parenthesis; the children's speech was added, usually one child at a time. Once a tape was transcribed, it was listened to as a continuous sequence, and re-checked several times.

All English tapes were fully transcribed by two native speakers of English and by E. (Arabic tapes were also transcribed by E and other Arabic speakers.) Two phonetician colleagues were called upon to transcribe doubtful portions of children's speech. The loop repeater in the department's language laboratory proved of tremendous help. In cases of disagreement, the final version was always agreed upon by two of the three transcribers. The punctuation of speech by native speakers ensured the presence of native speakers' judgment as to the segmentation of speech. Appendix B includes the general instructions given to transcribers.

IV. D. Criterion of Segmentation

The main difficulty in coding spoken data is defining the unit of analysis. While the 'utterance' has been central to most studies, its description in linguistic theory does not account for natural data and invites a number of inconsistencies when applied to actual speech. Therefore, a criterion in segmentation needed to be adhered to.

A unit of analysis or a separate utterance boundary was defined

in terms of what Lyons (1977) calls a 'text-sentence' or a structure which is grammatically, lexically and intonationally complete to stand in direct correspondence with system-sentences. In segmenting speech into one or two text-sentences or utterances, form, meaning in context and prosodic features were taken into consideration. At difficult portions of speech the main analytical decision employed was under which text-sentence system-sentence correspondence a specific utterance could be classified. The punctuation of native speakers was also another clue. The same criterion was applied to the segmentation of both adult and child speech. (Appendix C includes general notes on the segmentation procedure.)

V. Analysis of Children's Speech

The six children who form the basis of this study fall into three age-matched pairs of native and non-native English language acquirers. To assess their production and comprehension of English, a set of measures has been used in the analysis of their speech. The segmentation of children's spontaneous utterances followed the criterion outlined above (IV.D.). Fifty sequential utterances, after the first five minutes of tape, were analysed for each of the six children in each monthly session. This made up 350 utterances from <u>each</u> child over seven months in age pair 2 and 5 totalling 1.400 utterances for the four children. Fifty utterances were analyzed for each child in age pair 3, yielding 250 utterances per child over five months of observation and a total of 500 utterances for the pair. The data base of the six children's

speech thus consisted of 1.900 utterances over a mean period of observation of 6.3 months. The following measures were applied on all the utterances.

V. A. Mean Length of Utterance (MLU hereafter)

Brown (1973) devised a general index to measure the developing syntactic complexity of children's language in the form of the mean length of their spontaneous utterances in morphemes. MLU in morphemes counts the number of words and the number of inflections on them. As Brown argues:

> Every new kind of knowledge increases the length of an utterance: the number of semantic roles expressed in a sentence, the addition of obligatory morphemes, coding modulations of meaning, the addition of negative forms, auxiliaries used in interrogatives and negative modalities and, of course, embedding and co-ordination (p.77).

Thus, a developmental pattern of the grammatical knowledge of the child is plotted in terms of a simple index.

The sensitivity of mlu to linguistic stages of development has been corroborated by de Villiers (1973) and more recently by Crystal et al. (1976) who, using a notion of syntactic stages and not mlu ones, reported that most of Brown's descriptions corresponded to their own. Furrow et al. (1979) have also reported that an mlu count in words correlates highly with a count in morphemes in children's language. In the current study mlu is counted in morphemes following Brown's instruction which essentially counts the words and their syntactic inflections as being minimal segmentable units of grammatical analysis. (Appendix D includes Brown's instructions and

their amendments for the data base.)

An attempt was made to determine whether certain units functioned as one or two morphemes for these children. For instance, 'can't' was counted as two morphemes only if the form occurred in an obligatory context of negation and had been contrasted with 'can'. Likewise, 'don't' was treated as one unit until there was evidence the child produced the negative particle 'not'. Words such as 'beans', ''tatoes', 'smarties' were counted as one segmentable unit since they are often used in the plural by both adults and children. The present perfect form of the verb 'to break' was quite frequent and was counted as made up of three morphemes 'is broken' only after other forms of the verb had been used. While a close record of the three non-native children was kept (from both their home and nursery samples), the three native children were given the benefit of the doubt in scoring their production since it was not always possible to find examples of contrast.

Newport et al. (1977) made a distinction between language-specific constructions such as the auxiliaries and inflections and language-general constructions such as verbs and nouns, in their measures of children's linguistic variables. Following Newport et al. and Furrow et al., the same variables were computed for children's measures which meant that most of the subcomponents of the mlu were classified and expressed as mean numbers:

1. Verb/utterance: A count of the number of verbs per utterance was done on each 50 utterances of each sample. Verbs such as 'look' and 'see', which often function in child speech as attention getting devices, were included in the count. Newport (1976) included in this category post-nominal parts of speech used as verbs, e.g. off, as in dog off. These were not scored at all in the present scheme.

2. Noun/utterance: This classification counted the number of noun phrases (in subject or object position) per utterance. Vocatives were included in the count.

3. Pronoun/utterance: All pronouns in subject or object position were counted.

4. Copula/utterance: The copula was tallied separately since it is marked for tense, person and number. The contractible form 'that's right', frequent in the youngest group, was treated as one unitized expression and so was not included in the count.

5. Auxiliary/verb: The number of auxiliaries and semi-modals were counted, e.g. in the future, perfective, progressive and future progressive tenses.

6. Inflection/verb: The grammatical morphs of the progressive, perfective, third person and the regular past were counted and expressed as inflections per verb.

7. Inflection/noun: This count was composed of number inflections

and possessive markers.

All the language-general constructions (1 to 4) and the language-specific ones (5 to 7) were added up to make two separate total scores for these measures on the basis that these two major categories might be a better indicator than their individual components.

V. B. Progress score (rate of development)

All the children's measures were submitted to a further analysis in terms of individual progress score. This was done by computing the means of the first two samples and substracting it from the means of the last two samples (the gain by the end of the sampling period) and then dividing the value by the number of months between these two points. This method gives an estimate of the child's rate of progress. The comparison between the development of each pair was expressed as a positive sign if the rate of one child's gain was higher than another. For instance, if F's rate on copula was 0.18 and N's was 0.14, then F's rate is higher and is indicated by a (+). If these same figures were obtained in a measure of no responses or incorrect ones, then the child who scores fewer mistakes receives the positive sign; in this case 0.14 represents fewer mistakes and N receives the positive sign.

V. C. Comprehension Measures:

In order to assess the comprehension abilities of the three

pairs of children, two techniques have been devised, each of which represented a comprehension score:

1. Teacher's evaluation 2. Judges' assessment

V. C. 1. Teacher's Evaluation:

Cross (1977) computed a receptive ability score for her subjects by giving mothers a set of sentences to administer 'in small doses throughout the observation session' and then she 'assessed each child for his ability to give verbal and non-verbal evidence of comprehending the meaning of 100 syntactically different sentences' (p.157). Rather than disturbing the naturalness of the observation by small doses of testing sentences that may or may not be related to the child's current focus of attention, and rather than having the experimenter assess the verbal or non-verbal evidence of understanding, the following technique was developed.

At every sampling point 50 units of adult speech to each child were processed for their adult analysis. These 50 units represent exchanges between each child and his caretaker; exchanges which require verbal responses, others which require physical responses and yet others which require non-verbal responses (facial expressions, gestures). All these exchanges represent a compelling indication to the adult interactor of whether or not the child has been able to process and understand the meaning of her structure. The teacher's evaluation is founded on the direct context of the child's verbal or non-verbal response and depending upon the

immediate evaluation of comprehension, the teacher may choose to alter her behaviour by either accepting, refusing or correcting the child. In this respect, the 50 utterances exchanged with each child become a test of the child's understanding. The teacher herself becomes the judge of the child's behaviour by the very fact that she chooses, in the context available to her, to treat the child's reply as valid, giving meaning to her own previous utterance. In other words, this method uses the natural flow of interaction between adult and child to compute his comprehension rate and allows the teacher -- as she actually does in her daily routine -- to rate the child's behaviour. For these purposes, an exchange was defined as any structure that elicited a verbal or non-verbal response from the child. Exchanges may not necessarily take the form of a question but could very well be a statement to which the child responds or indeed an elicitor of a turn and an opportunity to speak. The method yields the following three measures:

(a) Correct Response

The number of times a child's response was acceptable to the teacher was expressed as a percentage. Apart from E's presence in the immediate context and her comments on it, there were a number of linguistic pointers which showed that the teacher treated the child's response as correct. Utterances like 'that's right' or 'good boy' are obvious indicators. The acknowledgement of the child's response by an affirmative 'yes' and an exact repetition of that response, or the extension and development of a reply into a new elicitor or indeed the lack of repetition of the teacher's

initial contribution are all forms of acceptance of a correct response. (Below are examples from the samples showing the tape number, adult speech to addressees AN or AF, and page number.)

7 AN 13

Child: Make an aeroplane.
Teacher: That's not the way you ask to make an aeroplane.
Child: Please.
Teacher: That's a little bit better.

The teacher uses a statement to elicit a response from the child and follows it by another one assessing his contribution.

8 AF 10

Teacher: What do you think that is?
Child: Giraffe.
Teacher: How do you know it's a giraffe?
Child: (No response)
Teacher: How do you know it's a giraffe?
Child: I know.
Teacher: How do you know?

This sequence consists of four exchanges. The child's first response is acknowledged as correct because the teacher incorporates it into a new sub-topic and a new elicitor. The teacher's second exchange receives no response and she repeats her previous utterance. The child's new response is assessed as valid and incorporated into a repeated exchange.

(b) Incorrect Response

The number of times the teacher treats the child's response as not exhibiting a comprehension of her message was treated as a percentage. This is signalled either by a straightforward correction of the reply or by an emphasis on the important part of her message.

3 AF 11 Teacher: Put the pan down there.
Teacher: Down.
Teacher: [vocative] I said down there.
Teacher: That's it.

9 AF 15 Child: Lions
Teacher: That [vocative]
Is that a lion?
Child: Yes.
Teacher: It's a monkey.

(c) No Response

The number of elicitors to which the child did not respond was treated as a percentage. This category is clearly marked by the teachers recourse to repetitions or paraphrases because the turn has not been taken.

9 AF 6 Teacher: What's the baby doing?

Child: (no response)

Teacher: What's the baby doing?

Child: (no response)

Teacher: Is she happy or sad?

Child: (no response)

Teacher: What do you think, [vocative]?

Child: Crying.

Teacher: That means she's sad.

V. C. 2. Judges' assessments:

The second technique is a blind evaluation of children's abilities without the benefit of the contextual sequence of exchanges. For each pair, three tapes were selected representing the beginning, middle and end of the observation period:

age pair 2: tape 1 (November), 4 (February), 7 (May).

age pair 3: tape 8 (February), 10 (April), 12 (June).

age pair 5: tape 13 (December), 16 (March), 19 (June).

All exchanges in each tape to which the native and non-native children responded were copied verbatim on to a separate sheet. The exchanges to which the child failed to respond or responded monosyllabically were automatically omitted as they could not be indicative of comprehension without the wider context of the conversation (and the technique in V.C.1. had taken care of such instances). The child's name was deleted wherever it ocurred so as not to prejudice the judges to the type of listeners. Ten exchanges

with each child were randomly selected from each tape's transcription, thus making a total of 30 test items for each of the six children over the period of observation. The 60 exchanges for each age pair were arranged in random order and presented to the judges as though they had been produced to one child. (Appendix E includes the 180 test items given to the judges with a corner letter tag for the benefit of the experimenter.) The final presentation included the following structures:

(a) wh-deictic questions.

(b) wh-questions of all types.

(c) Yes/No questions to which the child responded in more than one word. There were also instances of alternative yes/no questions as 21A and yes/no question with wh-word embedded as 25B.

(d) Imperatives to which the response was verbal.

(e) Intonation questions, as in 45A.

(f) Occasional questions, as in 55A.

(g) Tag questions, as in 16C.

(h) Declaratives, as in 47B.

Twenty adult native speakers of English acted as judges. Six were from teaching and non-teaching staff of the linguistics department, six were postgraduates in Law, Divinity and Chemistry departments and eight were undergraduate students in the faculties of science or arts. The judges had one option: either a yes or no decision. The investigator made sure that the subjects understood the instructions and specifically asked them to ignore the

grammaticality of the child's responses and only judge his understanding of the teacher's sentences. The number of yes judgements was tallied for each judge and each child at each developmental point. Hence each judge's score for a child represented his mark out of ten items. This method allowed each of the twenty judges to discriminate between the abilities of two types of listeners and to give them a score respectively. As each judge scored two listeners, a correlated t-test of difference was carried on each period and on the overall span of observation.

VI. Analysis of Teachers' Speech

The research questions were investigated in the form of a set of specific hypotheses related to 42 indices of adult language: rate of speech, general well-formedness, surface structure features, complexity features and discourse measures. In Chapter Two, Section VI, the specific hypotheses about the direction of differences in inputs were discussed and tabulated (Table 2.5). Most of the measures employed are either similar to or refined levels of analysis of measures previously used in the field. They were chosen partly to replicate previous studies and partly to make it possible to compare speech to two types of listeners with results predicted from earlier investigations. The matched speech samples of three adult teachers interacting with three native and three non-native children yielded six sets of data at repeated points in time. The data were tested for the effect of children's stages on the formal and functional adjustments of their caretakers' speech. Each major category captures specific aspects of the motherese characteristics

and will be defined according to its application in this study with a brief summary of its predicted direction.

VI. A. Rate of Speech

As indicated earlier (Chapter Two, Section II.1.d.), a slow rate of speech represents less phonetic, syntactic and semantic loading than a quick rate. Therefore, the linguistically less proficient member in each age pair should receive a slower rate of speech than the more proficient member.

It was also pointed out earlier that the method used by researchers is biased by intrinsic and extrinsic discourse factors. To calculate the mean number of words per minute within a stretch of five or ten minutes automatically includes two factors intrinsic to the discourse itself:

(a) Pause: which is the time when the adult speaker is silent, waiting for the child to respond or to take up a turn. That is, it is 'dead time'. It can also include time until the adult makes a new contribution.

(b) Response: which is the time when the adult speaker is silent because the child is actually occupying speaking time.

In effect, (a) and (b) comprise time controlled by the child listener. The latency and the extent of the child's responses reduce the adult's speaking time and may be erroneously interpreted

as indicative of a slow speech rate on the part of the adult.

To avoid this artefact, a stop watch was used to calculate net and gross values of words per minute. Adult's 'net value' includes the natural pauses between words and within sentences but excludes both '(a) and (b)' whereas a gross value includes both '(a) and (b)'. Similarly, child's gross amount includes '(a) and (b)' and his net amount includes his actual speaking time or '(b)'. Instances where both adult and child speak simultaneously are added to the separate net tally of each speaker.

Although this technique is more time-consuming than the one used by researchers (Broen, 1972; Cross, 1977), it produces the following accurate measures:

i. an accurate rate of speech for the adult addressing each child in the pair.

ii. a measurement of the amount of speech addressed to each listener.

iii. an accurate rate of speech for each child in the pair which is a discriminative measurement of the child's own fluency.

iv. a measurement of the amount of speech produced by each child in the pair.

The measure was applied to the five minutes of adult-child

speech after the first five minutes of the recording session. The early tapes for each age pair (2, 8, 14) were analyzed.

VI. B. Overall Measures

The parameters under this category all provide a summary characterisation of the data in terms of its syntactic complexity, physical distribution and sentence well-formedness. Each parameter will be defined in terms of its predictions and application in the study.

VI. B. 1. MLU

Brown's index has been widely employed to measure the maturity of both adult and child spontaneous speech. As indicated earlier (Chapter Two, II.2.a), the longer the utterance, the more syntactic and semantic relations it encodes and hence the more complex it becomes for the listener to process and understand. The major hypothesis of a fine-tuned position is that the less proficient the child, the shorter the mlu of adult speech to him, but the more development a child undergoes, the longer the adult's mlu becomes. As applied to the data, the predictions made in Chapter Two, Section VI. (Table 2.5) state the following: the non-native children would receive significantly shorter mlus than the native children since the theory predicts that the stages of children control their linguistic inputs.

While decisions concerning the segmentation of utterances were

made according to the principles stated earlier (IV.D. and Appendix C), two other decisions were used:

VI. B. 1. a. Sample Size

If, as we have argued earlier (Chapter Two, II.1.d. and II.2.a.), there is an extrinsic discourse factor at play in the rate of speech and in mlu, and if the events talked about change, then the selection of a small sample size would enable us to capture any internal change associated with fluctuations in discourse. A large sample size, on the other hand, might run the risk of averaging out fine internal changes. Moreover, a small sample size can tap the predicted incremental increases in adults' mlu if there are increases to find. Therefore, a monthly sample of 50 utterances for each of the six children was deemed reasonable. Previous researchers had used much smaller or much larger samples than this study. (Freed (1978) chose 25 utterances, Harkness (1977) used 30 utterances, Longhurst and Stepanich (1975) worked on 50 utterances while Cross (1977) selected 300 utterances.)

The first five minutes were not included in the analysis to allow enough time for the conversation between adults and children to be picked up. The first 50 utterances to either child after the five minutes criterion were analyzed. This amounted to 700 utterances for the foreigner and the native in age pair 2, 700 utterances for each member in age pair 5 whereas 500 utterances were analyzed for age pair 3. Consequently, the corpus of adult speech to the six children consisted of 2,600 utterances. For all the

tapes, except 5 and 6 (age pair 2), there were samples of 50 utterances addressed to both listeners jointly. These were tallied separately.

For the analysis of adult speech to other adults, 50 utterances were obtained from each of the three teachers, once in talking to their peers and once in talking to the investigator. As with the methodology employed in recording adult-child speech, speech among/between adults was also obtained surreptitiously. However, all teachers knew that the investigator had a tape recorder and was carrying on recordings for her study.

VI. B. 1. b. Components of mlu

In operating mlu on adult speech researchers have used the morpheme as the countable unit (Lord, 1975) or the syllables (Moerk, 1975) or, most frequently, the word (Furrow et al., 1979). As a count in words involves fewer theoretical and practical decisions than the others, word counts were used in this study.

The following rules were used for mlu in words:

1. A word consists of an orthographic unit with any inflection attached to it; e.g. walked, mummy's, elephants, going.

2. Contractible forms are counted as two words; e.g. can't, don't, it's, you're, d'you.

3. Stutterings or repetitions of one word within the unit are counted once only.

4. Within an utterance, examples of speaker's self corrections (change of mind, or slips of the tongue) are not counted; e.g. 'He came yesterday morning, afternoon' equals 4 words.

The following example demonstrates how a stretch of speech was divided according to the segmentation criterion and counted in words, producing 2 utterances, 20 words and mlu of 10.0 words.

13 AF 12 Teacher: Yes, it's got a handle yes.
and d'you, when mummy fills the
kettle does she, where does she
put it, to heat the water?

VI. B. 2. Mean Number of Utterances per Turn (hereafter MUT)

This index provides a physical description of the conversational structure of the 50 utterances sampled. A turn is defined as speech by one speaker before the next speaker occupies the floor or between pauses which require to be filled by the next speaker. In cases where the listener does not take up his turn and the adult repeats the utterance a second or third time, each repetition represents a new turn. It is expected that the adult would repeat more to the foreigner and hence, there will be fewer utterances per turn than in speech to the native.

VI. B. 3. Complete sentences

Complete sentences are considered 'ideal' and simple input and indicate the well-formedness of speech. It is therefore predicted that the non-native child will receive significantly more complete stimuli than the native subject. Complete sentences are expressed as a proportion of the 50 units selected for the analysis.

VI. B. 4. Sentence fragments

Sentence fragments are predicted to be significantly few in speech to the linguistically naive subjects. These fragments all share the characteristics of being moodless utterances which, due to their intonation contour and contextual completeness, can be put in correspondence with system-sentences. They include three types which in a finer level of analysis are classified under their respective sentence type:

type a: elliptical replies to questions, mostly prepositional phrases, e.g. 'In the cupboard.' or other moodless utterances, e.g. 'Nice beach at North Berwick.'

type b: isolated constituents uttered with question intonation, usually following a previous speaker's turn, e.g. 'A Vauxhall?', 'Your bubbles?'.

type c: prepositional phrases or isolated constituents uttered with imperative intonation, e.g. 'The ball.', 'Down there.'.

VI. B. 5. Interjections[1]

As with sentence fragments, interjections are predicted to be few in speech to the foreigner as they represent unitized elements not broken down to retrievable constituents. These include stock expressions with or without exclamation marks, e.g. 'Here you are.'; 'Good for you!'; 'On you go.'; 'All right.' etc.

VI. C. Surface Sentence Type

This level of analysis has been employed to test particularly whether or not the syntactic features of the input are tuned to the linguistic needs of the linguistically naive member of the pair. It has been mentioned (Chapter Two, II.2.c.) that following Fodor, Bever and Garrett's (1974) work on adult speech perception, Newport et al. (1977) argued that sentence type distribution in motherese is psycholinguistically complex because it violates the simplest canonical word order arrangement. Moreover, as Newport et al. argued (Chapter Two, V.B.) motherese is not simple in presentation because it exhibits of wide-ranging distribution rather than a narrow selection of one structure at a time. It was also predicted (Chapter Two, VI) that if the fine-tuning hypothesis is supported, the non-native pair member should receive fewer 'undeformed sentences' and a narrower range of surface structures than the native pair member.

This level of description consists of the following categories:

VI. C. 1. Declarative (Total)

This category includes the following sentence types:

i. Declaratives: Structures which preserve the canonical word order of Subject-Verb-Object/complement in their surface arangement.

ii. Deixes: Structures which are introduced by deictic forms as this, that, here and there.

iii. Fragment Declaratives: Structures which in context and with complete intonation contour can be reconstituted to a declarative or deictic sentence type. e.g. 'Not nippy sauce, just fruity.' or 'That bit over there.'

VI. C. 2. Imperative (Total)

This variable is made up of all imperative structures:

i. Positive Imperatives: Structures which deviate from the canonical word order by deletion of the subject in sentence initial position.

ii. Negative Imperatives: Similar in structure to the positive imperatives, but are introduced by the auxiliary and the negative particle. e.g. 'Don't put the books away.'

iii. Imperatives With Subject: These structures are either positive or negative imperatives which retain the pronoun or vocative subject

in initial position. As they preserve an undeformed representation of deep structure, they are predicted to be proportionately more in AF than in AN.

iv. Fragment Imperatives: These are elliptical structures in which subject and verb are omitted, but compensated for by a definite imperative intonation and propositional content. They may have a vocative or pronoun subject in initial or final position. e.g. '(Vocative) Down from the sink.' or 'All the lego in there.'

VI. C. 3. Questions (Total)

This category includes the possible realization, found in the data, of text-sentences which stand in correspondence to interrogative system-sentences.

i. wh-questions: These structures undergo auxiliary movement and a wh-word replacement at sentence initial position of forms of 'where', 'when', 'what', 'why' and 'how'. These also include wh-deictic questions (e.g. What's that?).

ii. wh-final: These structures have been referred to by Brown and Bellugi (1964) as occasional questions (e.g. You went where?). These fail to undergo auxiliary movement and wh-word replacement in initial position, but replace it in final position.

iii. Auxiliary Yes/No Questions: These structures undergo auxiliary fronting to sentence initial position. This syntactic rearrangement

requests a monosyllabic answer in the form of 'yes' or 'no'.

iv. Raised Verbs: These structures fail to front the auxiliary and invert the subject since both are absent from initial position. These behave like the auxiliary yes/no questions in their raised intonation and their focus on monosyllabic replies. They are referred to in this study as raised verb since, by default, the verb placed in initial position rises in the surface tree.

e.g. 'Make it over?'
or 'Going to put some more?'
or 'See the car there?'

When 'see' structures did not have a raised intonation and were not punctuated with an interrogative mark by the native transcribers, they were classified as positive imperative; (e.g. 'See if you can do it.' was interpreted then as 'Try to do it.').

v. Raised Intonation: Together with the previous parameter (iv), these are often collapsed with the total auxiliary yes/no questions (Newport, 1976) or classified as 'other yes/no' (Furrow et al., 1979). While both these sub-categories elicit monosyllabic replies, they fail to front the auxiliary in sentence initial position. Following the general prediction for questions, these sub-variables are also expected to be proportionately lower in AF than in AN.

e.g. 'You're hungry today?' or 'I've to drink it?'

vi. Declaratives + tag: These structures move the inverted auxiliary and subject pronoun to sentence final positions. While these are similar to the previous two sub-categories (iv and v) in eliciting monosyllabic replies and are collapsed with them (Wells, 1980), unlike them, they retain the auxiliary at the end of the sentence. In the data, there were very few examples of these structures with deleted subject (e.g. 'Do it for you, will I?') which were included under this category.

vii. Tags: A straightforward inverted auxiliary and subject pronoun with raised intonation which, unlike the declarative + tag structures, take its morpho-syntactic concord from the previous speaker's utterance.

e.g. Child: 'I went to the zoo.'
Teacher: 'Did you?'

viii. Fragment Questions: These are isolated constituents, usually an article, a noun and a qualifier uttered with a raised intonation contour and eliciting a one-word reply.

e.g. Child: 'A cowboy hat?'
Teacher: 'A man on the motorbike?'

VI. D. Complexity Parameters

This level of description comprises a set of specific hypotheses

related to various syntactic and morpho-syntactic aspects of complexity in the data. For purposes of replication, they are similar to measures used by previous research. If the fine-tuning hypothesis is supported, we expect significantly less complex speech to be produced to the non-native child in comparison with the native listener. The measures below were computed on the 50 units of speech to each child at each interview.

VI. D. 1. Present tense: All verbs in the present tense were counted.

VI. D. 2. Past tense: The number of utterances with past tense verbs were tallied.

VI. D. 3. Future tense: The number of utterances with future tense reference were counted. Following Furrow et al., the future construction 'is going to' was counted in this category.

VI. D. 4. Verbless utterances: The number of utterances without a verb were tallied.

VI. D. 5. Multiproposition: A tally was kept for the number of utterances in the samples which contained co-ordinated or subordinated clauses attached to the main clause.

VI. D. 6. S-nodes/Sentence: Following Newport (1976), the mean number of underlying sentence-nodes equivalent to the

mean number of verbs per sentence was calculated.

VI. E. Discourse Features

To test the effect of children's abilities on their caretakers' discoursal adjustment, three main categories have been used and their predictions were tabulated in Chapter Two, Section VI (Table 2.5). The three categories and their sub-divisions were mutually exclusive; their definition was narrowly stated in order to be operated objectively by the investigator.

VI. E. 1. Imitation (Total):

This category comprises all the utterances which occur immediately after the child's own utterance. Irrespective of their potentially beneficial role as reinforcement, they all echo the child's contribution.

i. Imitation: Following Cross (1977), all the adult utterances that repeated exactly, or in part, the child's preceding utterance were coded under this heading.

e.g. Child: 'Purple.'

Teacher: 'Purple, yes.'

ii. Transformed Imitation: Following Cazden (1965), quoted in Cross (1977), this category coded the utterances that repeated the child's

preceding production with any change in form (i.e. sentence type) or function.

e.g. Teacher: 'Where are you going for your holiday?'
Child: 'Somewhere else.'
Teacher: 'Somewhere else?'

VI. E. 2. Correction (Total):

As in the previous measures, this group comprises all the adult's contributions that operate directly on the preceding utterance of the child. Yet, unlike the previous classification, these all exhibit some form of structural (not necessarily functional) change to the grammar and/or appropriateness of the child's message; hence their descriptive label. While this heading seems to suggest intentional behaviour on the part of the adult, it does not necessarily entail one. In strict terms, a correction is an instance where the adult makes it verbally clear to the child where he has made an error. That is, the adult might specifically instruct the child (e.g. 'wrong', 'we don't say this...', 'say the car goes in and not go in'). But very often this kind of explicit correction is absent and more specifically so in cases of syntax correction. What the adult behaviour involves is agreement or disagreement with the child's utterance or even a repetition for the adult's own sake during which the adult amends the child's utterance. This additive imitation of a child's utterance could be syntactic, semantic or a rephrase of the whole contribution.

i. Syntactic: the adult's utterances which directly repeat the child's with syntactic amendments referred to in the literature as expansions. e.g.

e.g. Child: 'It's wheel.'
Teacher: 'It's a wheel, yes.'

or

Child: 'It fit.'
Teacher: 'Yes, it fits.'

(This category frequently involves agreeing with the child, not, as it were, questioning his reply, and takes a falling rather than a rising intonation. On the basis of this observation, examples such as the following: Child: I jumping. Teacher: You're jumping? were classified as transformed imitation rather than a correction of syntax which is marginally so.)

ii. Semantic: The imitation of the child's utterances with semantic change is overtly marked as it affects the truth value of the child's proposition.

e.g. Child: 'It's red.'
Teacher: 'No, it's blue.'
or: 'No, it's not red.'
Child: 'That's a top.'
Teacher: 'It's the top of the house, the roof.'

iii. Rephrase: This involves a reshuffle of both the lexical and

syntactic organization of the child's preceding utterance.

e.g. Teacher: 'Oops.'
Child: 'Oops. It oops in your knee.'
Teacher: 'Yes, it fell on to my knee.'

OR

Child: 'I can fix that way.'
Teacher: 'You mean you can't pull it apart?'

OR

Child: 'Sometime I do like that (about her hair).'
Teacher: 'I see, sometimes it is tied at the back with a ribbon.'

OR

Child: 'Santa give her hammer (about her brother).'
Teacher: 'So Santa Clause brought him a hammer.'

VI. E. 3. Repetition (Total):

This classification comprises all the adult utterances which directly operate on the adult's own preceding contribution.

i. Repetition: The number of utterances that are exact repetitions of one of their preceding utterances within 3 utterances of the original. (The 3 utterances limit initiated by Snow (1972) seems to be adhered to by most researchers except Newport (1976) who included as repetitions up to 10 preceding utterances.)

e.g. Teacher: 'What's the baby sitting in?
What's the baby sitting in?'

ii. Transformed Repetition: This is a count of a sequential repetition of any preceding adult utterance that altered the sentence type (or function) of the original contribution (similar to Cross, 1977).

e.g. Teacher: 'You're not going to hit that.
Don't hit that with the brick.'

OR

Teacher: 'Are you getting the pans out?
The pots and pans out.'

iii. Paraphrase: Following Snow (1972), this category comprises a semantic repetition of lexical items contained in the original adult utterance (up to 3 utterances). That is, it extends the meaning of previous adult speech.

e.g. Teacher: 'That's the dish washing mop.
That's to wash the dishes with.'

VII. Summary and Statistical Analysis

This dissertation seeks to determine the factors which shape the

child's linguistic experience. It is specifically designed to test whether or not adults exhibit fine syntactic tuning to the linguistic ability of their listeners and whether or not such tuning can account for the children's learning requirements. The design has matched three non-native with three native English speaking children of similar ages in order to analyze the effect of children's linguistic stages on the adjustments of their respective teachers over time. The linguistic factor has been isolated as an independent variable or potential cause for teachers' syntactic tuning by allowing only the linguistic levels of the subjects to vary within each age pair. The study, therefore, is a direct test on the fine-tuning hypothesis which predicts a high degree of correlation between input features and children's ability at all descriptive levels, but particularly at the syntactic level (Cross, 1977).

To substantiate the above prediction in the current comparative design, the study employs independent samples and correlated samples t-tests for its statistical analysis. All quotations of t-tests are one-tailed since, as Robson (1973) points out, this can safely be used when there is 'a good reason for specifying the expected direction of the difference between the means' (p.73). The age-matched design and the selection of non-native English speaking children together with the strong prediction of the fine-tuning theory and of research into input to children and to foreigners, all secure 'a good reason' for one-tailed t-tests quotations.

Whereas there is some justification for using a correlated

sample t-test for children's measures since speech samples had been obtained under the same condition (teacher, setting, topic, locality), it was decided otherwise. As each pair had been selected for their independent linguistic levels, independent subject design t-tests were considered more appropriate than correlated ones. The 13 parameters which measured the verbal behaviour of each child at each sampling point were submitted to independent samples t-tests. Only one of the comprehension measures - judges' assessment - used a correlated t-test of difference because the same judge had evaluated two types of listeners.

As the same teacher had addressed the foreigner and native member of her age-pair, correlated sample t-tests were calculated for adult parameters. The 2,600 adult utterances of three teachers interacting with six children over a mean sampling period of 6.3 months were coded into 40 variables which embodied a set of hypotheses related to the purposes of the research: five overall measures, 18 surface sentence types, 6 measures of complexity and 11 measures of discourse features. Means and standard deviations were computed on the 40 parameters for each longitudinal sample of adult speech addressed to each listener. These included 7 observations for each child in age pairs 2 and 5, and 5 observations for each child in age pair 3. The mean difference was subjected to one-tailed significance tests.

To sum up, the study experimentally manipulates the child's variables in the hope of finding meaningful differences between input to two linguistically different listeners at three different

ages. It attempts to identify the size of the linguistic factor which has been predicted to explain the differences between motherese and adultese. It therefore seeks an answer to the question of what indeed shapes the learner's linguistic experience.

Note to Chapter 3 :

[1] - The classification of fragments and interjections in this study are modifications on the schemes followed by Furrow et al. (1979) and Newport (1976). Furrow et al. collapse the two categories and treat fragments a and b not as fragments or interjections but as two sentence types: declaratives and yes/no questions without auxiliary respectively. Newport, on the other hand, has two separate categories for interjections and fragments but includes fragments (without a description of their types) in a surface structure nodes count but not in a surface structure type count. The scheme used in this thesis classifies each category separately and then gives a total value of the type of structure it represents. Moreover, it has a separate complexity measure for all verbless utterances as well as for S-nodes.

CHAPTER FOUR - Fine-tuning Results

I. Introduction

This chapter presents a first account of the results obtained in testing the fine-tuning hypothesis. It is organized into five parts. Part I introduces the rationale. Part II reports on children's measures in each age-pair. Part III presents the findings for tests of differences between adults' speech to two types of listeners. Part IV reports overall results while Part V attempts to draw some conclusions about the hypothesis in the light of the present findings. However, before assessing adults' speech, we must establish that each non-native child does differ significantly from his age-matched native speaker control on the linguistic parameters investigated. If so, it becomes possible to ask whether or not adults' speech is finely tuned to the linguistic sophistication of the child listener. Given the design of the study, it is expected that pair members in each age group will differ significantly in their mastery of English. As language acquisition follows a decelerating curve, it is also expected that the linguistically less sophisticated subjects will demonstrate a faster rate of linguistic development than their native controls as each set of subjects will be at different learning points on that curve.

II. Children's Speech

Each age-pair will be dealt with separately. The letters F or

N refer to the Foreigner or the Native subject.

II. A. Age-pair two

The period of observation extended for seven months (from 26 to 32 months of the children's age). The measures of language ability calculated over this developmental stage all show the predicted direction of difference between the two children. Table 4.1 reveals that on 7 measures F is significantly less proficient than N. On the remaining 3 measures (verb / utterance, pronoun / utterance, inflection / verb), the analogous trend does not reach significance at $p<.05$. (Appendix G presents monthly records for F and N.) MLU of F is very significantly less than mlu of N ($p<.001$) and places F at Brown's (1973) Stage II whereas N is within Stage III. The same strong effects are found in the total measures of language-general and language-specific constructions. The two children, therefore, differ significantly in terms of language production and N is always more proficient than F.

The rate of development index (last two columns in Table 4.1) demonstrates that both children have improved over the 7 months of observation. As explained earlier (Chapter Three, V.C.2) the positive sign in parenthesis is given to the child who has a higher score. As predicted, F's rate of progress is higher than N's. On 5 variables (mlu, verb / utterance, pronoun / utterance, total / utterance, inflection / noun), F shows more rapid development than N, while on 3 variables (noun / utterance, inflection / verb, total / verb and noun), N shows greater development. On 2 variables

Table 4.1· Means and (Standard Deviation) of children's linguistic parameters and rate of development for age-pair 2, (26 to 32 months).

	Child's Speech Parameters	Means (S.D.)		Rate of Development (+ faster)	
		N	F	N	F
	Mean Length of Utterance	3.62 (0.31)	2.78*** (0.42)	0.13	0.18 (+)
Language - General	Verb/utterance	0.53 (0.13)	0.51 (0.19)	0.02	0.06 (+)
	Noun/utterance	0.59 (0.25)	0.32* (0.14)	0.06 (+)	0.02
	Pronoun/utterance	0.49 (0.17)	0.41 (0.15)	0.02	0.06 (+)
	Copula/utterance	0.15 (0.11)	0.07* (0.04)	0.01	0.01
	Total/utterance	1.75 (0.27)	1.31** (0.33)	0.11	0.14 (+)
Language - Specific	Auxiliary/verb	0.25 (0.14)	0.08** (0.07)	0.02	0.02
	Inflection/verb	0.23 (0.09)	0.22 (0.12)	-0.01 (+)	-0.04
	Inflection/noun	0.11 (0.05)	0.04* (0.06)	-0.01	-0.02 (+)
	Total/verb & noun	0.60 (0.14)	0.33** (0.12)	0.01 (+)	0.00
Comprehension	Correct Response	67.43 (7.57)	41.57*** (10.26)	-2.50	-0.20 (+)
	Incorrect Response	3.28 (2.50)	14.57** (10.75)	-0.30	-0.60 (+)
	No Response	29.29 (6.58)	43.86* (14.63)	2.20	0.80 (+)
	Judges' Assessment	79.00 (7.50)	49.17*** (12.40)	-1.50	2.17 (+)

Legend: *$p \leq .05$ **$p \leq .01$ ***$p \leq .0001$ (one-tailed)

(copula / utterance, auxiliary / verb), development scores are identical for the pair. It is interesting to note that F progresses faster than N on the indices of language-general construction (total of verb, noun, pronoun, copula/utterance is 0.14 for F and 0.11 for N). On the other hand, N's rate of development is higher on indices of language-specific constructions (total of auxiliary/verb, inflection/verb, inflection/noun is 0.01 for N and 0.00 for F). This difference argues that the listeners are at different stages of acquisition, with the less proficient child making faster development on the learning curve. Finally, the results show that, although the children are at different linguistic stages, they have both made progress over the period of observation with F showing a faster rate in certain areas.

The four measures of comprehension also indicate highly significant differences between F and N. F's understanding of English structures as assessed by the teacher and by independent judges (Chapter 3, V.C.) is deficient in comparison to his age match. Furthermore, over the observation period, F's comprehension abilities increased with his increasing knowledge of the language and are reflected by a faster development than N's. As explained in the methodology, the positive sign is given to the child who shows faster decrease in the percentage of 'incorrect response' and 'no response' since progress on these measures is marked by their gradual disappearance.

The final set of measures concerns the rate of speech computed for children out of a 5 minute sample. Table 4.2 indicates that on

all measures of amount and rate, N is more voluble than F. N occupies 52.67% of the 5 minute sample whereas F occupies only 35.33%. During that time, the output rate of N is nearly twice that of F (60.4 and 36.2 words per minute respectively). When pauses and response time are omitted, N's output rate is still higher than F's (114.68 and 102.45 words per minute respectively), but only just. These results argue that N is not only a more fluent speaker than F, but he also occupies more speaking time than F.

Table 4.2 - Children's Speech Rates out of 5 minutes for age-pair 2.

Parameters	N	F
% of Child time	52.67	35.33
Child word/minute (Gross Value)	60.40	36.20
Child word/minute (Net Value)	114.68	102.45

In summary, age-pair 2 differ from each other on all levels of descriptions as tested in 17 variables. While no longitudinal data exists for the 3 measures of time, the other 14 measures reveal a reliable significance at a very significant level. F is, therefore, in terms of language ability significantly less proficient than N.

II. B. Age-pair three

The period of observation for this age-pair is the shortest of the three age-pairs and extends from 35 to 39 months of age. Table 4.3 reveals that differences in the expected direction exist between F's and N's linguistic abilities. (Appendix G presents monthly records for F and N.) On 3 variables (mlu, copula / utterance, total language-general constructions), F is significantly less proficient than N ($p<.01$) while on one variable (inflection / verb) the means of the pair are identical. The remaining 6 variables point to a difference in the means in the expected direction (F being less proficient than N) but fail to reach significance. The two children are at different syntactic levels as measured by mlu; F is within Brown's Stage III and N is within Stage IV. The difference between them is highly significant ($p<.01$).

The index of language progress over the 5-month-period of observation shows that on 8 variables, F exhibits the expected faster development than N. On 2 measures (copula/noun, inflection/noun) the two children exhibit equal rates of development. The total of both general and specific aspects of language (verb/utterance, noun/utterance, pronoun/utterance, copula/utterance, auxiliary/verb, inflection/verb, inflection/noun) demonstrate F as undergoing more rapid development than N. Again, this is a predicted tendency since the less proficient the child (F) is, the more rapid his development is expected to be in comparison with N of the same age who is at an advanced point on a

Table 4.3 - Means and (Standard Deviation) of children's linguistic parameters and rate of development for age-pair 3, (35 to 39 months).

Child's Speech Parameters		Means (S.D.)		Rate of Development (+ faster)	
		N	F	N	F
	Mean Length of Utterance	3.58 (0.24)	2.69** (0.37)	0.12	0.24 (+)
Language - General	Verb/utterance	0.47 (0.17)	0.41 (0.11)	0.01	0.05 (+)
	Noun/utterance	0.59 (0.22)	0.52 (0.11)	-0.09	-0.04 (+)
	Pronoun/utterance	0.42 (0.18)	0.29 (0.13)	0.06	0.08 (+)
	Copula/utterance	0.20 (0.08)	0.07** (0.05)	0.02	0.02
	Total	1.68 (0.21)	1.30** (0.18)	0.01	0.11 (+)
Language - Specific	Auxiliary/verb	0.46 (0.10)	0.31 (0.19)	-0.02	0.01 (+)
	Inflection/verb	0.22 (0.12)	0.22 (0.12)	-0.01	0.02 (+)
	Inflection/ noun	0.17 (0.11)	0.09 (0.06)	0.03	0.03
	Total	0.85 (0.30)	0.63 (0.34)	0.00	0.05 (+)
Comprehension	Correct Response	72.40 (17.29)	46.20* (14.08)	-4.67	-3.83 (+)
	Incorrect Response	4.00 (5.48)	15.60* (10.06)	-1.67 (+)	1.83
	No Response	23.60 (14.99)	38.20 (12.89)	6.33	2.00 (+)
	Judges' Assessment	80.70 (8.20)	68.50*** (8.70)	-5.00	-0.20 (+)

Legend: *$p \leq .05$ **$p \leq .01$ ***$p \leq .0001$
(all one-tailed)

decelerating learning curve.

The 4 indices of comprehension demonstrate on all but one measure (percentage of 'No Response') that F is significantly different from N. Similarly, on all but one measure (percentage of 'Incorrect Response'), F's progress score is better than N's.

The last set of comparative results deals with time measures. Table 4.4 shows that while N and F take up the same percentage of speaking time (34% and 33% respectively), they fill it up remarkably differently. The output rate of N is 32.2 words per minute (gross value) and 94.7 words per minute (net value) which is nearly twice as high as F's output of 19.6 words per minute (gross value) and 59.3 words per minute (net value). These results argue that the quality and fluency of N's speech is higher than that of F.

Table 4.4 - Children's Speech Rates out of 5 minutes for age-pair 3.

Parameters	N	F
% of Child Time	34.00	33.00
Child word/minute (Gross Value)	32.20	19.60
Child word/minute (Net Value)	94.70	59.39

Although the significant differences between N and F are not as high or as many as those between N and F in age-pair 2, there is enough evidence on nearly all the variables analyzed to demonstrate that F is linguistically more limited than N. We can, therefore, safely conclude that the linguistic stages of these addressees are statistically different.

II. C. Age-pair five

There were seven sampling points for this pair from 66 to 72 months. Virtually all the parameters of language sophistication show that F's means are significantly lower than N's. Table 4.5 displays analogous trends to those reflected for the previous two age-pairs. (Appendix G presents monthly records for F and N.)

Seven variables display significant differences between F's and N's linguistic capabilities (mlu, noun / utterance, copula / utterance, total language-general constructions, auxiliary / verb, inflection / noun, total language-specific constructions). The remaining 3 variables (verb / utterance, pronoun / utterance, inflection / verb) exhibit analogous trends which do not reach significance at $p<.05$. F's mlu is very significantly lower than N's ($p<.001$), thus placing F within Brown's Stage IV whereas N is well beyond Stage V. The totals of language-general (verb / utterance, noun / utterance, pronoun / utterance, copula / utterance) and language-specific constructions (auxiliary / verb, inflection / verb, inflection / noun) also display statistically significant differences between members of the pair. Therefore,

Table 4.5 - Means and (Standard Deviation) of children's linguistic parameters and rate of development for age-pair 5, (66 to 72 months).

Child's Speech Parameters		Means (S.D.)		Rate of Development (+ faster)	
		N	F	N	F
	Mean Length of Utterance	5.73 (0.97)	3.86*** (0.74)	0.16	0.19 (+)
Language - General	Verb/utterance	0.16 (0.20)	0.46 (0.15)	0.03 (+)	0.02
	Noun/utterance	0.87 (0.09)	0.55*** (0.14)	-0.02	0.04 (+)
	Pronoun/utterance	0.06 (0.19)	0.46 (0.14)	0.05 (+)	0.02
	Copula/utterance	0.15 (0.07)	0.08* (0.05)	0.00	0.00
	Total	2.23 (0.37)	1.55** (0.34)	0.06	0.07 (+)
Language - Specific	Auxiliary/verb	0.38 (0.11)	0.22** (0.08)	-0.03	-0.01 (+)
	Inflection/verb	0.32 (0.16)	0.16 (0.12)	-0.01	0.02 (+)
	Inflection /noun	0.25 (0.10)	0.10** (0.10)	0.02	0.04 (+)
	Total	0.96 (0.12)	0.48*** (0.15)	-0.03	0.05 (+)
Comprehension	Correct Response	80.14 (3.53)	55.43*** (12.97)	-0.17	3.00 (+)
	Incorrect Response	2.00 (2.00)	12.14* (10.24)	-0.50	-2.30 (+)
	No Response	17.86 (5.05)	32.43* (17.28)	0.60	-0.70 (+)
	Judges' Assessment	90.20 (4.40)	68.70*** (11.70)	0.58	5.17 (+)

Legend: *p $\leq$.05 **p $\leq$.01 ***p $\leq$.0001
(all one-tailed)

with respect to indices of language production, F is significantly different than N.

The rates of development indicate that both children have improved over the developmental period of 7 months. As F is significantly less proficient than N, F is at a lower point on the decelerating learning curve and is, therefore, expected to demonstrate a faster rate of language progress. And, indeed, F does. On 7 variables (mlu, noun / utterance, total language-general constructions, auxiliary / verb, inflection / verb, inflection / noun, total language-specific constructions) F exhibits faster development than N, whereas on two measures (verb / utterance, pronoun / utterance) N shows the more rapid progress. Only on one parameter (copula / utterance) do the two children portray equal progress.

The comprehension results once again argue that F's understanding of English structures, as assessed by the teacher and independent judges, is significantly less than the native control. Indeed, the difference between the children is very reliable ($p<.001$). These results together wih those on language production demonstrate that F is at a definite lower point of language development than N and is therefore expected to show a faster progress on the decelerating learning curve. Indeed, F does show the predicted rapid rate on both measures of production and comprehension.

Finally, results for the children's rate of speech tend to

support the general trend of the above measures. N takes up 44.33% of speaking time whereas F takes slightly more than N (47.33%), as shown in table 4.6. However, both children do not fill up the time in the same manner although both have a similar output rate of 60.8 and 60.2 respectively. N produces more words per minute in net value (137.14) whereas F manages slightly less in net value (127.18). It is worthwhile noting that time measures only count words, not their grammatical correctness or even appropriateness. In principle, F may manage a similar number of words to N and although they may not be appropriate semantically or grammatically, they had to be included as part of her production. On the other hand, N, being a more proficient speaker, may manage fewer words than F because N is expected to have learned how to word a message correctly without redundancy. The results above support such analysis. N takes up less time than F, but fills up her net value slightly more efficiently than F; N's value is 137.14, whereas F's is 127.18.

Table 4.6 - Children's Speech Rates out of 5 minutes for age-pair 5.

Parameters	N	F
% of Child Time	44.33	47.33
Child word/minute (Gross Value)	60.80	60.20
Child word/minute (Net Value)	137.14	127.18

Once more, as with the other two age-pairs, age-pair 5 differ significantly from each other. The parameters used indicate that F is at a different learning stage, has more limited language abilities and is linguistically less proficient than N. In a similar manner to the other two foreigners, F in this age-pair not only produces fewer words to express herself, but also takes up more time than N in producing them.

II. D. Overall Results and Summary

The previous three sets of results demonstrated that on a number of parameters, each F member in each age-pair differs significantly from each N member. The data for this section examine whether the six children do, indeed, form two groups of distinctly different listeners (as they should). Statistics for independent samples design were applied to each of the seventeen parameters used for each of the six children. Table 4.7 shows that the foreigners are significantly less proficient than their native controls on twelve of the seventeen parameters. Fs have significantly lower mlu than Ns and significantly fewer nouns / utterance, pronoun / utterance, copula / utterance language-general constructions (total), auxiliaries / verb, inflections / noun and language-specific constructions (total). Fs also produce significantly fewer correct responses and significantly more incorrect and negative responses. As evaluated by twelve judges, Fs' understanding of English structures is significantly less than Ns'. Only on five measures are the t-values insignificant. These measures are verbs/utterance, inflection/verb and three measures of

Table 4.7 - Means and (Standard Deviation) of overall linguistic parameters for the three Ns and Fs.

Child Speech Parameters		N	F
Language - General	Mean of Length of Utterance	4.41 (1.22)	3.15*** (0.76)
	Verb/utterance	0.54 (0.17)	0.47 (0.16)
	Noun/utterance	0.69 (0.23)	0.46*** (0.17)
	Pronoun/utterance	0.51 (0.19)	0.40* (0.15)
	Copula/utterance	0.16 (0.09)	0.07*** (0.04)
	Total	1.91 (0.38)	1.40*** (0.31)
Language - Specific	Auxiliary/utterance	0.35 (0.14)	0.19** (0.15)
	Inflection/verb	0.26 (0.13)	0.2) (0.12)
	Inflection/noun	0.18 (0.11)	0.08** (0.08)
	Total	0.80 (0.24)	0.47** (0.23)
Comprehension	Correct Response %	73.42 (11.03)	47.89*** (13.20)
	Incorrect Response	3.00 (3.28)	13.95*** (9.91)
	No Response	23.47 (9.75)	38.16** (15.27)
	Judges' Assessment	83.27 (9.40)	62.11*** (14.69)
Speech Rate	% Child Time	43.66 (9.35)	38.55 (7.68)
	Gross Value	51.13 (16.39)	38.66 (20.41)
	Net Value	115.50 (21.23)	96.34 (34.30)

Legend: *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$

speech rate. The overall results, therefore, argue that the two listeners in each age-pair are linguistically different and taken together form two groups of statistically distinct addressees.

To summarize, fourteen language production and comprehension measures and three measures of speech rates were used to determine the linguistic ability of each of the six children who participated in this experiment. The t-values obtained on fourteen language production and comprehension measures for age-pair 2 demonstrated that F was significantly less proficient than N on eleven parameters. Results for age-pair 3 indicated that on six measures F was significantly less proficient than N. Results for age-pair 5 formed a similar pattern to those for age-pair 2. Eleven out of fourteen measures showed that F was significantly less sophisticated than N. It follows, therefore, that each F in each age-pair was at a significantly different linguistic stage than each N control. The overall results also demonstrated that the six children formed two sets of significantly different listeners, with the foreigners linguistically more limited than their native controls. Consequently, we are now in a position to assess the effect on adult's speech of the two different linguistic levels of the addressees in each age-pair. More particularly, it is possible to ask whether adult speech is finely-tuned to the linguistic abilities of each child or even to each group of listeners, or whether it is a response to overall concomitants of the addressees' ages.

III. Adult Speech

As summarized by Cross (1977, p.154), the fine-tuning hypothesis states that input is closely tailored to the child's linguistic requirements and predicts a high degree of correlation between mothers' speech features and the child's ability at all descriptive levels, but particularly at the syntactic level. As tested in the present experiment, adult speech to N (AN) and adult speech to F (AF) were expected to differ significantly on all levels of description and particularly at the syntactic one. As N and F in each age-pair have statistically different linguistic levels, adult input parameters may be expected to be controlled by that difference at a significance level of .05 or better in one-tailed t-tests.

In order to test the hypothesis that input is closely tailored to the child's linguistic requirements, the differences between AN and AF should fall in the predicted direction. In Chapter Two, Section III, we reviewed the basis upon which the hypothesis rests (slow speech rate, short mlu, low complexity ratio, etc.); in Sections V.B and VI of Chapter Two we also formed expectations of what might represent simplicity in description and presentation of input (see also Table 2.5 in Chapter Two for a summary of simplicity and significance). Consequently, the less complex input (where we know what 'less complex' is) should be directed to the less proficient member of each age-pair. Therefore, AF in each age-pair is expected to be slower than AN, to contain significantly shorter mlu, proportionately fewer syntactically deformed surface structures (i.e. fragmented and verbless utterances, rearranged or deleted surface constituents, etc.), proportionately more

well-formed surface structures and significantly fewer multipropositions and morphologically complex verbs. In that sense, the presentation of input to the less proficient member of the pair would be less complex, containing a narrower range of surface sentence distribution, a more systematic production of one structure at a time and a higher concentration of more easily processable linguistic units than in speech to the more proficient member. This syntactic profile would confirm the prediction that on the syntactic level of description, input features are closely tailored to the child's linguistic requirements and may act as language learning models. Finally, on the discourse level, AF is expected to include more corrections and repetitions than AN.

Fulfilment of the above stated predictions would be considered as evidence for the effect of the addressees' limited linguistic abilities on teachers' syntactic adjustments. The findings reported below for each age-pair do not match the expectations, especially at the syntactic level of description. The fine-tuning hypothesis seems to be supported only on the discourse level and in very limited features of input which do not actually represent a syntactically simpler input to the simpler listeners. The findings obtained for the 42 sub-hypotheses associated with the measures used are now tabulated and discussed.

III. A. Adult speech to age-pair two

III. A. 1. Words per minute

As seen in Table 4.8, the two addressees receive a different distribution of speaking time. The percentage of AF is 64.67 whereas it is only 47.33 for AN. In gross values, the teacher seems to produce more words per minute to F than to N (118.2 and 94.6 respectively). However, when 'dead time' is removed, the values change dramatically. AF contains 182.78 words per minute and AN contains 199.86 words. The teacher tends to speak more slowly to F than to N in this age-pair, but the difference is not great. As the difference between AN and AF was minimal even at the early stages of the recording, it was not pursued longitudinally.

Table 4.8 - Teacher's speech rate in 5 minutes to N and F in age-pair 2.

Teacher's parameters	AN	AF
% of time	47.33	64.67
word/minute (Gross Value)	94.60	118.20
word/minute (Net Value)	199.86	182.78

III. A. 2. Overall Measures

The strongest evidence for a fine-tuning position would have been represented by significant differences between AN and AF on the gross measures involved under this category. The least

expected result was obtained for mlu which is a measure of overall syntactic complexity. Table 4.9 shows that AN has an mlu of 5.58 words and AF has 5.56 mlu. The two mlu values for AN and AF are comparable to Fraser and Roberts' (1973) A/C mlu to 18-month-olds (5.5 words in storytelling) and fall within A/C mlu range of 3.48 to 6.60 words for the age range of 24 to 28 months (as indicated in table 2.1 in Chapter Two). In other words, the results obtained for AN and AF mlu values corroborate previous descriptions in the literature of short mlu in adult speech to children.

However, what is not corroborated are the conclusions drawn by previous researchers that adult mlu is one step ahead of the child's (Cross, 1977 among others) or that the linguistic stages of the addressees control A/C mlu. Indeed, our results contradict the expectations of the fine-tuning hypothesis (as well as the direction of difference as reported in Table 2.5, Chapter Two). F and N in this age-pair are at two significantly different linguistic stages; F's mlu is 2.78 and N's is 3.62 ($p<.001$). If the fine-tuning predictions had been fulfilled, we would have had significant differences between AN and AF mlus, with AF containing significantly shorter mlu than AN. What we obtain is a surprising similarity between the two mlu values (AN 5.58 words and AF 5.56 words) and their standard deviations which does not support a stage-related hypothesis. Nor does it support the prediction that the less sophisticated listener of the pair receives a syntactically less complex input overall than the more sophisticated member. The longitudinal records (Appendix H) show a range of AN mlu from 4.84 to 6.60 and AF mlu from 4.70 to 6.60.

These figures indicate that over 6 months mlu changed slightly over time, on average by 1.76 words in AN and by fractionally more in AF (1.86 words). While such change corroborates previous observations that mlu changes slowly over time (Phillips, 1973), it does not fulfil the prediction that mlu systematically changes with language growth. If that change is to be attributed to some factor, it seems likely to be to both the age and maturity of the listeners or indeed to some external factor.

The mean number of utterances per turn (MUT hereafter) in AF differs significantly from AN. The direction of difference is also according to the prediction and is in line with Wells' (1980) results. On average, every 1.80 number of utterances elicit a speaking turn from F whereas every 2.00 number of utterances require conversation from N. Although the difference is slight, it is maintained longitudinally (see Appendix H). MUT indicates that the teacher tends to put greater demands on the less proficient member of the pair by producing more elicitors to him than to his native control.

Another significant difference obtains in the percentage of fragments and in their direction. As predicted, AF includes fewer fragmentary and incomplete utterances than AN (8.00 and 11.43 respectively). The mean of complete sentences is also slightly in favour of the limited listener in the pair. AF includes 86.57 complete sentences whereas AN has 83.43. The difference between AF and AN seems to be the product of the distribution of fragments in both inputs. While these results could somehow lend some support

to a fine-tuned position, they are counterbalanced by the result on overall syntactic complexity as measured by mlu. MLU for AN and AF did not reveal any difference while the difference between AN and AF in the percentage of complete sentences did not reach any significance. Moreover, the means for interjections do not show any significant difference between AN and AF.

III. A. 3. Surface Sentence Type

The eighteen variables under this heading are classified into three structural categories: declarative total, imperative total and questions total. According to the fine-tuning predictions, AF is expected to contain significantly fewer deleted or rearranged surface structure constituents (imperatives and questions respectively) and significantly more declarative structures. The findings counter these predictions. There is not one significant difference between the means of AF and AN on the eighteen variables tested as indicated in Table 4.9. The most surprising result is that the two significantly different listeners receive a strikingly similar input in terms of surface sentence distribution. Such similarity cannot argue for a stage-related hypothesis.

III. A. 4. Complexity Measures

The fine-tuning hypothesis rests on the assumption that the less complex input is produced to the less mature listener and it is in these measures where the strongest support for the hypothesis is predicted. Speech to the foreign member of the pair should be

Table 4.9 - Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 2 (26 to 32 months).

	Adult Speech Parameters	Means (S.D.) AN	AF
Overall	Mean length of utterance	5.58 (0.61)	5.66 (0.66)
	Mean number of utterance/ turn	2.00 (0.35)	1.80* (0.16)
	Sentence	83.43 (4.58)	86.57 (6.29)
	Fragment	11.43 (3.40)	8.00* (4.16)
	Interjection	5.14 (4.87)	5.43 (3.78)
Surface Sentence Type	Declarative (Total)	35.43 (9.50)	36.00 (4.76)
	Declarative	20.86 (6.31)	22.00 (6.63)
	Deictic	12.86 (8.71)	13.14 (6.31)
	Fragment Declarative	1.71 (2.13)	0.86 (1.07)
	Imperative (Total)	17.43 (9.57)	18.00 (7.21)
	+ Imperative	11.71 (6.37)	12.00 (5.03)
	- Imperative	0.57 (0.98)	0.86 (1.57)
	Imperative + Subject	4.00 (3.46)	3.71 (3.35)
	Fragment Imperative	1.14 (1.57)	1.43 (2.51)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 4.9 - (cont'd) Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 2 (26 to 32 months).

Adult Speech Parameters		Means (S.D.)	
		AN	AF
Surface Sentence Type	Questions (Total)	42.00 (14.33)	40.57 (9.43)
	Wh-question	9.71 (8.75)	11.43 (6.19)
	Wh-final	1.14 (2.27)	0.57 (0.98)
	Aux. yes/no	11.71 (2.93)	10.57 (3.60)
	Raised Verb	0.86 (1.07)	1.71 (2.43)
	Raised Intonation	7.71 (2.13)	8.29 (2.69
	Declarative + tag	1.14 (1.07)	1.14 (2.27)
	Tag	1.14 (1.07)	1.43 (2.23)
	Fragment Question	8.57 (2.99)	5.43 (2.99)
Complexity	Present	65.71 (4.96)	71.43 (10.31)
	Past	6.86 (5.52)	5.14 (5.52)
	Future	10.86 (2.54)	10.00 (4.00)
	Verbless utterance	16.57 (4.58)	13.43 (6.29)
	Multiproposition	8.00 (6.43)	8.29 (4.54)
	S-node/sentence	1.10 (0.08)	1.10 (0.05)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 4.9 - (cont'd) Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 2 (26 to 32 months).

	Adult Speech Parameters	Means (S.D.) AN	Means (S.D.) AF
Discourse Features	Imitation (Total)	11.14 (4.14)	5.43** (3.95)
	Imitation	3.43 (2.99)	1.43 (1.51)
	Transformed Imitation	7.71 (3.35)	4.00* (3.65)
	Correction (Total)	4.29 (2.43)	6.57 (5.13)
	Syntactic	1.43 (2.50)	2.00 (2.00)
	Semantic	2.00 (2.31)	3.14 (2.27)
	Rephrase	0.86 (1.57)	1.43 (2.25)
	Repetition (Total)	18.86 (5.40)	35.43** (7.18)
	Repetition	7.43 (3.60)	14.29* (6.87)
	Transformed Repetition	5.14 (3.80)	9.71* (5.82)
	Paraphrase	6.29 (1.80)	11.43* (3.60)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .0001$ (1-tailed)

significantly simpler than to the native control. Consequently, AF is expected to contain significantly less non-present reference, significantly fewer single propositions and verbless utterances. Moreover, as indicated in Chapter Two, Table 2.5, Furrow et al. (1979) and Wells (1980) report significant correlations between single propositions and child's mlu. Since F and N differed significantly in their mlus, the six measures of complexity are likely to produce significant results if there are results to be found. Unfortunately, the findings do not reinforce the hypothesis. There is not one significant difference between AN and AF on any of the six parameters used. The direction of difference is, however, maintained in only two measures. Table 4.9 shows that the mean of AF is slightly higher than AN in present tense forms and slightly lower in verbless utterances. The findings under this level of description cannot argue for a hypothesis based on syntactic adjustments dependent on the listener and his stage of linguistic sophistication.

III. A. 5. Discourse Measures

Of the eleven variables analyzed under this level of description all exhibit the expected direction of difference between AN and AF. Six reach significance at 5% or better.

i - Imitation (Total)

The grand mean of AF for this category is significantly smaller than the grand mean of AN and only one of its sub-categories

reaches significance. N's speech is significantly more subject to 'transformed repetition' than F's speech. As any form of correction was classified separately, it seems, then, that N's utterances were either reinforced or acknowledged in the form of 'imitation' or 'transformed imitation'. It is logical to assume that N is more capable than F of producing acceptable utterances which are approved by the teachers.

ii - Correction (Total)

Although the difference between the grand means of AN and AF does not reach significance, nor do the means of the sub-variables of this category, the direction of difference is according to expectation. The less proficient listener tends to receive more corrections than the more proficient one. In both AN and AF, semantic correction is more predominant than syntactic correction. This is similar to Brown et al.'s (1969) observation that parents tend to correct the truth value of their children's propositions more than the syntax. The teacher of this age-pair exhibits comparable behaviour to that of parents.

iii - Repetition (Total)

The grand mean of AF for this category as well as the means of its sub-variables are significantly greater than the values of AN. The teacher repeats and explains her utterances to both children, but for the less proficient child of the pair all types of repetitions are reliably more frequent. The findings for this

category are according to the predicted differential treatment for the child's linguistic and communicative needs.

To summarize, out of forty variables examined, there are eight significant differences between AN and AF, six of which are in discourse measures and two in overall syntactic parameters. With a 5% probability, two out of the eight results could have been obtained by chance. On the level of discourse, the results are generally in line with Cross (1977, 1979) and indicate a differential treatment to the less proficient listener. However, on the syntactic level of description, a stage-related hypothesis is not supported. The findings cannot be taken as evidence that the adult tunes the syntactic aspects of his speech to accommodate the significantly different language abilities of these age-pair listeners.

III. B. Adult speech to age-pair Three

III. B. 1. Words per minute

As mentioned previously (II.B; also, Table 4.4) N in this pair is more fluent than F in gross value (32.2 and 19.6 words per minute respectively) as well as in net value (94.7 and 59.39 words per minute respectively). Surprisingly, the teacher does not show any sign of accommodating the large differences in fluency or volubility between the pair-members. Both children receive a similar percentage of speaking time from their teacher, 66% for N and 67% for F. As seen in Table 4.10, gross value and net values

for words per minute are strikingly similar in AN and AF. As there was no indication of slower speech to the foreigner at the early stages of the recording, the measure was not carried out longitudinally.

Table 4.10 - Teacher's speech rate in 5 minutes to N and F in age-pair 3.

Teacher's parameters	AN	AF
% of time	66.00	67.00
word/minute (Gross Value)	111.60	116.00
word/minute (Net Value)	169.09	173.13

III. B. 2. Overall Measures

According to the prediction in Table 2.5 (Chapter Two), AF is expected to contain significantly shorter mlu, mut, significantly more complete sentences and fewer fragments than AN. The findings under this heading do not match the expectations of a stage-and-listener-dependent hypothesis. Whereas individual figures for each child are in line with previous values in the literature, the results for the pair taken together do not support the conclusions which researchers have previously drawn. As seen in Table 4.11 (below), AN contains 5.14 words and AF has 5.09 words in mlu. The teacher's mlu to each child is within the range of mlus reported in the literature for children between the ages of 30

Table 4.11 - Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 3 (35 to 39 months).

	Adult Speech Parameters	Means (S.D.) AN	AF
Overall	Mean length of utterance	5.14 (0.41)	5.09 (0.34)
	Mean number of utterances/ turn	2.22 (0.67)	1.55* (0.11)
	Sentence	82.80 (3.90)	80.40 (4.77)
	Fragment	8.80 (4.15)	12.80** (4.15)
	Interjection	8.40 (3.29)	6.80 (2.28)
Surface Sentence Type	Declarative (Total)	32.40 (14.79)	18.80 (4.15)
	Declarative	24.40 (14.24)	10.00* (2.00)
	Deictic	4.80 (4.82)	3.20 (5.22)
	Fragment Declarative	3.20 (3.90)	5.60* (2.61)
	Imperative (Total)	13.20 (8.07)	6.40* (5.37)
	+ Imperative	7.20 (5.02)	5.20 (3.63)
	- Imperative	0.40 (0.89)	0.00
	Imperative + Subject	4.40 (4.34)	1.20* (1.79)
	Fragment Imperative	1.20 (1.01)	0.00*

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 4.11 - (cont'd) Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 3 (35 to 39 months).

	Adult Speech Parameters	Means (S.D.) AN	Means (S.D.) AF
Surface Sentence Type	Questions (Total)	46.00 (11.05)	68.00** (8.60)
	Wh-question	17.60 (5.18)	29.20* (12.93)
	Wh-final	0.40 (0.89)	0.00
	Aux. yes/no	13.60 (3.85)	20.40* (6.07)
	Raised Verb	0.40 (0.89)	0.00
	Raised Intonation	2.40 (1.67)	2.40 (3.29)
	Declarative + tag	4.00 (2.45)	2.80 (1.79)
	Tag	3.20 (2.28)	6.00 (6.78)
	Fragment Question	4.40 (3.58)	7.20** (4.45)
Complexity	Present	77.60 (5.90)	69.60 (10.53)
	Past	2.00 (2.00)	6.40 (13.22)
	Future	3.20 (1.79)	4.40 (5.55)
	Verbless Utterance	17.20 (3.90	19.60 (4.77)
	Multiproposition	11.20 (4.38)	10.80 (4.82)
	S/node/sentence	1.14 (0.05)	1.14 (0.06)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 4.11 - (cont'd) Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 3 (35 to 39 months).

Adult Speech Parameters		Means (S.D.)	
		AN	AF
Discourse Features	Imitation (Total)	4.40 (4.34)	7.20 (3.63)
	Imitation	2.80 (1.79)	4.40* (1.67)
	Transformed Imitation	1.60 (2.61)	2.80 (2.68)
	Correction (Total)	5.20 (5.93)	6.80 (3.35)
	Syntactic	0.00	1.20 (1.79)
	Semantic	4.00 (4.90)	4.80 (2.28)
	Rephrase	1.20 (1.79)	0.80 (1.79)
	Repetition (Total)	17.20 (3.35)	26.80* (7.16)
	Repetition	3.20 (1.79)	8.00* (3.75)
	Transformed Repetition	8.40 (5.37)	9.60 (3.58)
	Paraphrase	5.60 (0.89)	9.20** (2.28)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

to 36 months (2.84 to 9.00 words as shown in Chapter Two, Table 2.1). However, while the difference between the mlu of the pair is highly significant (N's mlu is 3.58 and F's is 2.69 $p<.01$), the difference between AN and AF is not. The longitudinal records (Appendix H) also show that AF can be longer than AN. It is difficult to reconcile such results with arguments about 'systematic' changes in adult's speech to suit the listener's linguistic needs. The two significantly different listeners do not receive significantly different mean length of utterances and therefore the less mature child does not receive a significantly simpler input than his more mature control.

The direction of difference between AN and AF in fragments and complete sentences represents further contradictory results to the simple input / simple listener predictions. AF contains significantly more incomplete sentences (12.80) than AN (8.80), whereas AN has slightly more complete sentences (82.80) than AF (80.40). The reverse of what has been predicted takes place on these variables.

Once again, MUT in this age-pair shows a significant effect. For every 2.22 utterances, N receives the opportunity of a turn, whereas every 1.55 utterances, F is called upon to contribute. Significantly more demands are placed upon the less mature child to participate in the conversation. The same pattern also occurred for age-pair 2, denoting that the foreigners in the pairs were less talkative than their native controls.

III. B. 3. Surface Sentence Type

If adults adjust their syntax in order to present the child with a simple text, as the fine-tuning hypothesis states, then speech to the foreigner is expected to consist of simpler structures than speech to the native listener. In Chapter Two, Section V.B., it was argued that canonical structures represent the easiest and simplest deep structure recovery. Consequently, AF is expected to contain significantly more declarative sentences and significantly fewer deformed structures such as deleted imperatives and rearranged interrogatives. Unfortunately, this is not the case with the data. Unlike the results of age-pair 2 for these measures, the difference between AN and AF in age-pair 3 is significant in nine out of eighteen variables. However, the direction of difference is contrary to predictions of structurally simpler input to the simpler listener.

i - Declarative (Total)

The overall means for AN and AF fail to differ significantly in spite of the fact that the sub-variables do. AF mean declarative is significantly smaller than AN. Also, AF contains significantly more fragments than AN, but fewer deictic structures than AN. Taken together, it is difficult to argue that the simpler structures (declaratives and deictics) have much to do with the less proficient pair member since AN has significantly more canonical and hence simpler structures than AF (Table 4.11 above).

ii - Imperative (Total)

The findings under this description are as confusing as the published results and do not lend coherent support to a fine-tuning interpretation. Rather (and for the time being), they seem remotely related to Newport's multifactor hypothesis of directing the action of the child. Table 2.5 (Chapter Two) shows that there are two significant but conflicting results on the association of adults' use of imperatives with the child's linguistic stage as measured by mlu. Newport (1976) reports a significant negative correlation between imperatives and the child's mlu. When this result is changed into expectations concerning the pair design, the less proficient child should receive significantly more imperatives than the more proficient one. On the other hand, Furrow et al. (1979) report a highly significant positive correlation between imperatives and a child's mlu. As transformed into expectation in terms of the study, the less mature child should receive significantly fewer imperatives than the more mature one. Furrow et al.'s result matches the prediction of the fine-tuning hypothesis of fewer deformed structures to the less competent listener.

The sub-variables only partially fulfil such a prediction. The difference between the grand means of AF and AN shows that the foreigner receives significantly fewer imperatives than the native control (Table 4.11). This finding satisfies expectations gathered from Furrow et al.'s data and from the hypothesis of simpler inputs to simpler listeners. Consequently, according to this conclusion,

the non-deformed imperatives which retain initial subject constituents are expected to be significantly greater in number to the simpler listener of the pair. The major sub-variable under this category behaves in just the opposite direction. N receives significantly more non-deformed imperatives than F. This contradiction among sub-variables makes it difficult to reach a coherent argument in support of a simpler input to the simpler listener. The distribution of imperative structures does not therefore seem to accommodate the linguistic requirements of the linguistically immature listener.

Newport's result and hypothesis argue that the less mature the child, the more directives he requires to control his action and hence more imperatives are produced to him. Although the figures do not support Newport's position since F received fewer imperatives than N, the interpretation below is indirectly related to her view. The more proficient child (N) is expected to be able to dominate the conversation and to have the verbal ability to take up a turn when the less proficient child (F) fails to fill one. In dealing with both children, the teacher has to exert more control in directing N's contribution as when or not to participate in the interaction. In that sense, the teacher has to mark her exchanges with the native by nomination or commands, whereas she has to signal her exchanges with the foreigner by elicitation or interrogatives. As a result, fewer utterances precede F's turn to speak whereas more utterances precede those of N. According to these functional purposes, the distribution of surface sentence types as well as turns vary dramatically as Table 4.11 demonstrates

for this age-pair. Chapter Five will deal with this issue at length. At any rate, as both listeners are of similar age, they are both subject to a control of their overall behaviour as Newport has argued.

iii - Questions (Total)

In a similar manner to the above category, the findings here do not lend coherent support either to the fine-tuning hypothesis or to the published interpretations. Table 2.5 (Chapter Two) displays two significant but contradictory correlations between adults' use of questions and the child's mlu. Cross (1979) reports a significant negative correlation between the total number of questions and the child's mlu. When this result is transformed into expectation about the present design, the less proficient child should receive significantly more questions than the more proficient one. On the other hand, Harkness (1977) reports significant positive correlations between questions and the child's mlu. According to this result, then, F should receive significantly fewer questions than N. In fact, Harkness' result is in agreement with the prediction of the fine-tuning hypothesis of fewer deformed structures to the less competent listener.

Furthermore, even if the criterion of simplicity is not defined in purely syntactic description, but rather in terms of a 'fit' between input and the child's processing bias, questions and their sub-classification contradict such a fit. According to Slobin (1973), an important operating principle for the child is to 'Avoid

interruption or rearrangement of linguistic units' (p.199). Questions, in general, do not seem well-suited to this strategy and are therefore expected to be proportionately fewer to F than to N.

Table 4.11 displays results contrary to the predicted direction of difference. AF's grand mean is significantly higher than that of AN (68.00 and 46.00 respectively). Three of the sub-variables demonstrate similar significant effects. AF has significantly more wh-questions, auxiliary inverted yes/no questions and fragment questions than AN. So although AF differs significantly from AN, the nature of difference does not match the description of simplicity which is supposed to accommodate the linguistically naive listener. Rather, the frequency of questions places more demands upon F to contribute to conversation than N.

III. B. 4. Complexity Measures

Not one of the six complexity variables helps to confirm the fine-tuning hypothesis despite the fact that these parameters could have produced the strongest evidence. No measure reaches significance level and none follow the predicted direction. On the contrary, the trend for the morphologically complex past tense forms shows that F receives more complex verbs than N. The same trend also holds for the percentage of verbless utterances. On both multiproposition and S-nodes, AF and AN contain almost the same values.

III. B. 5. Discourse Measures

The eleven variables analyzed under this level of description display the expected direction of difference save for imitation. Four variables reach significance at 5% or better (Table 4.11).

i - Imitation (Total)

While the grand means of AN and AF do not differ significantly, the trend is in the opposite direction from what is predicted. The teacher imitates F's utterances more frequently than N's. As the sub-variable of imitation reaches significance, the result suggests that the teacher acknowledges or reinforces F's contributions at a higher rate than N's.

ii - Correction (Total)

Although there is no significance attached to any of the measures, the trend is in the predicted direction. AF contains slightly more syntactic and semantic correction than AN. In close similarity to the behaviour of the previous pair, this teacher also demonstrates a higher proportion of semantic rather than syntactic corrections to both listeners.

iii - Repetition (Total)

The grand mean and the subsequent sub-types save one (transformed repetition), all show significantly higher values for AF than AN.

In short, out of forty variables tested, there are fifteen significant differences between AN and AF, four of which are in discourse measures. With 5% probability, thirteen results are not chance, and depict a differential treatment between these age-pair members. However, the results are not consistent with the predictions of a simpler language model to the less proficient member. Rather, F receives proportionately more complex surface structures than N although both children receive almost similar inputs in terms of complexity and overall measures. A further check to the hypothesis comes from the results of the three pairs. Age-pair 3 showed the lowest number of significant differences between its members (six out of fourteen measures), whereas age-pair 2 and 5 displayed eleven significant differences between its respective members (see II.A; B; C). Nevertheless, adult speech results are higher in age-pair 3 (fifteen) than in age-pair 2 (eight). Indeed, the sheer disparity between the number of significant differences for F and N (only six) and the number of significant results between AF and AN cannot lend coherent support to the fine-tuning position.

III. C. Adult speech to age-pair Five

III. C. 1. Words per minute

As shown in Table 4.12 the two addressees receive almost similar time (55.67% for AN and 52.67% for AF). Words per minute change dramatically depending on whether or not pauses are removed. In gross value, AN has 118.2 words and AF has 108.4 words. In net

value, AN contains 212.33 words whereas AF contains 205.82. As there were very slight differences in words per minute for the two listeners at the early stages, the measure was not computed longitudinally. There is no evidence on these variables for a slower speech to the less proficient listener.

Table 4.12 - Teacher's speech rate in 5 minutes to N and F in age-pair 5.

Teacher's parameters	AN	AF
% of time	55.67	52.67
word/minute (Gross Value)	118.20	108.40
word/minute (Net Value)	212.33	205.82

III. C. 2. Overall Measures

The results obtained under this category are similar to those found for the previous two age-pairs and generally corroborate previous conclusions. The findings for overall measures of syntactic complexity cannot argue for a stage-related hypothesis. As mentioned earlier (II.C.), the difference between the mlu of the pair is very significant (N's mlu is 5.73 and F's mlu is 3.86 $p<.001$). According to the stage-and-listener-dependent hypothesis, the teacher's mlu to each listener should reflect that difference. It does not. AN is, on average, 5.63 words long while AF is a

surprising 0.17 word longer, on average 5.80 words long (Appendix H provides longitudinal instances). This is another blow to the hypothesis as well as the literature which predict significantly shorter utterances to the less proficient member of the pair. This lack of difference between AN and AF mlu, which is also substantiated by findings for the other two age-pairs, cannot support the position of 'systematic' changes in adults' speech to suit the stages of the listeners. Such a conclusion is further confirmed by results for complete sentences, fragments and interjections. AN and AF consist of almost identical values on these variables (see Table 4.13).

MUT is the only measure which demonstrates a significant difference between the listeners. After an average of 1.84 utterances, there is a turn for F while N has one after 2.57 utterances ($p<.01$). As argued earlier (III.B.2. and 3), the frequency of turns places greater demands on F to participate in the interaction than on N. In that sense, the frequency of turns is related to the frequency of questions to the less proficient pair member.

III. C. 3. Surface Sentence Type

The difference between AN and AF under this heading is significant in five out of eighteeen categories. However, as with the previous results of the two age-pairs, the direction of difference does not match the prediction of syntactically less complex input to the less proficient child.

Table 4.13 - Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 5 (66 to 72 months)

	Adult Speech Parameters	Means (S.D.)	
		AN	AF
Overall	Mean length of utterance	5.63 (0.53)	5.80 (0.80)
	Mean number of utterance/ turn	2.57 (0.39)	1.84** (0.33)
	Sentence	73.14 (8.33)	73.29 (10.16)
	Fragment	15.86 (6.84)	16.14 (7.80)
	Interjection	11.00 (2.45)	10.57 (3.69)
Surface Sentence Type	Declarative (Total)	37.57 (12.31)	25.86** (7.76)
	Declarative	16.86 (5.46)	13.57 (5.91)
	Deictic	10.29 (8.03)	6.57 (3.30)
	Fragment Declarative	10.43 (3.78)	5.71** (2.93)
	Imperative (Total)	2.29 (1.38)	1.43 (1.40)
	+ Imperative	1.29 (1.11)	0.86 (0.69)
	- Imperative	0.00	0.00
	Imperative + Subject	1.00 (1.15)	0.57 (1.13)
	Fragment Imperative	0.00	0.00

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 4.13 - (cont'd) Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 5 (66 to 72 months)

	Adult Speech Parameters	Means (S.D.) AN	Means (S.D.) AF
Surface Sentence Type	Questions (Total)	49.14 (11.33)	62.14** (8.51)
	Wh-question	11.14 (4.14)	15.00* (4.08)
	Wh-final	0.14 (0.38)	0.43 (0.53)
	Aux. yes/no	15.14 (6.52)	20.86 (7.43)
	Raised Verb	0.00	0.00
	Raised Intonation	6.86 (2.34)	7.43 (2.44)
	Declarative + tag	5.29 (2.36)	4.86 (3.80)
	Tag	5.14 (3.80)	3.14 (3.18)
	Fragment Question	5.43 (4.04)	10.43* (6.73)
Complexity	Present	60.71 (18.81)	53.71 (18.53)
	Past	9.71 (10.48)	18.42 (14.97)
	Future	2.71 (5.19)	1.14 (2.61)
	Verbless Utterance	26.86 (8.34)	26.71 (10.16)
	Multiproposition	9.29 (2.56)	10.57 (2.07)
	S/node/sentence	1.13 (0.03)	1.15 (0.03)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 4.13 - (cont'd) Means, (Standard Deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 5 (66 to 72 months).

	Adult Speech Parameters	Means (S.D.) AN	Means (S.D.) AF
Discourse Features	Imitation (Total)	13.43 (4.20)	9.00* (3.16)
	Imitation	10.86 (4.14)	7.71* (3.04)
	Transformed Imitation	2.57 (2.82)	1.29 (0.76)
	Correction (Total)	3.29 (1.98)	7.43* (3.55)
	Syntactic	0.00	0.29 (0.76)
	Semantic	1.00 (1.15)	1.43 (0.79)
	Rephrase	2.29 (1.80)	5.71* (3.20)
	Repetition (Total)	14.29 (7.59)	27.00* (15.11)
	Repetition	3.29 (2.36)	3.29 (4.42)
	Transformed Repetition	5.71 (4.61)	13.43* (8.06)
	Paraphrase	5.29 (4.64)	10.29** (4.57)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

i - Declarative (Total)

The grand mean of AF shows that the linguistically naive pair member receives significantly fewer canonical structures than the linguistically mature member. For a fine-tuning view to be endorsed, the result should have read: F receives significantly more simple declarative sentences than N.

ii - Imperative (Total)

The grand mean of AN and AF as well as their sub-components do not differ significantly from each other. Similar to the pattern of age-pair 3, F receives slightly fewer imperatives than N.

iii - Questions (Total)

Whereas there are three significant differences between input to the foreigner and the native, the nature of these differences does not display the predicted simplicity. Table 4.13 corroborates the pattern of difference and direction found for age-pair 3. AF contains significantly more questions (total), wh-questions and fragment questions than AN.

III. C. 4. Complexity Measures

Once more the measures which could have lent the strongest support for a stage-dependent hypothesis are the very ones which confound it. Not one of the six parameters reaches significance.

Neither does the direction of difference exhibit any clear pattern. The morphologically complex past tense is surprisingly more common in AF than in AN, indicating the tendency of more non-present reference in speech to the foreigner than to the native. Both inputs seem almost identical on the rest of the variables.

III. C. 5. Discourse Measures

The finding on this level of description is the highest of all the 3 age-pairs involved in the study. There are seven significant differences between AF and AN.

i - Imitation (Total)

The grand mean and one of its sub-variables (imitation) show that AF displays significantly less imitation than AN. This result is in accordance with the prediction and consistent with that reported for age-pair 2.

ii - Correction (Total)

There is significantly more correction in AF than in AN. As with the observation made for the other two age-pairs, semantic correction is consistently more frequent than syntactic. Furthermore, correction of the whole utterance or rephrasing reaches significance for this age-pair.

iii - Repetition (Total)

The difference between AF and AN is both significant and in the predicted direction. The less proficient pair member has significantly more opportunities to hear a sentence repeated with either syntactic or semantic elaboration. It is, however, interesting to note that F and N receive the same amount of repetition. The result suggests that simple repetitions reflect the adult's own echoic style rather than her response to the listeners' abilities.

To recapitulate, there are thirteen significant differences between AN and AF, six of which are in syntactic distribution and seven on the discourse level of description. However, these results do not match the expectation of the fine-tuning hypothesis. Four out of six syntactic differences are in the 'wrong' direction as they contribute to the linguistic complexity of structures addressed to F. Significantly more questions (wh and fragments) are found in AF and significantly fewer declaratives are produced to the less proficient listener. Furthermore, AF is almost as long as AN and has a very similar level of complexity. Indeed, AF contains more morphologically complex tense forms and fewer here-and-now references. The findings for this pair generally confirm those found for the previous two sets of pairs. We turn now to overall results across the three pairs of listeners.

IV. Overall Results

The aim of this section is to submit the fine-tuning hypothesis to a further test across the three pairs of linguistically

different addressees. If adult speech is syntactically tailored to the child's linguistic requirements then AF 2, 3 and 5 should be significantly different from AN 2, 3 and 5. In order to support the theory that adult syntactic adjustments furnish the child with simple and graded language models, then the difference between AF and AN should be in accordance with our best known description of simplicity. If such direction is not obtained, it would be difficult to maintain the hypothesis that the syntactic and functional profile of adult speech to children is monitored by the listener's linguistic needs.

It is important at this point to consider Furrow et al.'s (1979) argument in the light of the present research. The authors criticized Newport et al.'s (1977) effect study and its statistical treatment (double partialling procedure) because it assumed that (a) effects of motherese were similar at all ages and levels of language development over the one- to two-year age range used; and (b) changes in the use of particular forms were equally likely regardless of a child's age or stage (op. cit. p.425). Although the point is well-taken and valid for studies of input effect on language growth, the case is different with the present methodology for the following reasons.

First, Newport et al.'s study had no internal control in their design. Children differed in age and language ability and different adult speakers are likely to respond differently to such attributes. By pooling results across different ages, language abilities and different speakers, there was the further assumption

that mothers' verbal behaviour was uniform irrespective of listeners' attributes. In the present design internal controls have been used. Children were originally matched by age and formed two groups of linguistically naive and linguistically mature addressees. Moreover, the same speaker has interacted with the pair-members over a period of time and this has allowed a direct test on the longitudinal adjustments of the same speaker to the linguistic abilities of the pair-members in the three pairs. So overall results would still test differences in input which are due to linguistic differences between two types of listeners.

Second, in their own experiments, Furrow et al. selected children of the same age (18 months) and the same stage (1.00 - 1.40 mlu) and studied the effect of mothers' input at 18 months on their children's output at 27 months (9 months later). They report, however, that the children's comprehension level was significantly different at 18 and 27 months ($p=.05$). There is no reason to discard comprehension as a factor perhaps more important than age or stage in controlling parents' speech. Indeed, researchers such as Bohannon and Marquis (1977), Cross (1977) and Van Kleeck (1978) argue that comprehension provides the feedback which adults use in shaping their child-directed speech. Thus, the apparently stage-related results of Furrow et al. could very well have been due to significant differences in children's comprehension abilities. In this research, each foreigner was significantly different from the native control in the comprehension of English structures. Moreover, the three Fs formed a group significantly different on that variable from their

respective three Ns. Therefore, comparisons across the three pairs would not cancel out the effect of their significantly different comprehension skills on their teachers' speech.

Third, more importantly, in comparing across the three pairs, nothing disappears on average which was not really negligible when looked at individually. In Section II (A to D) of this chapter, it was shown that for every N stage, the age-matched F trails behind at a significantly different stage. If Furrow et al.'s stage-related syntactic hypothesis were substantiated, we would have obtained significant differences between AF and AN in each pair at the syntactic level of description. The results reported in Section III do not generally lend support to such a position and indeed do not match the predictions on the syntactic level. In that sense, overall comparisons are likely to produce results only if there are results to be found.

The results to be reported below confirm the findings obtained for individual age-pairs. There are no significant differences between input to the two groups of listeners on the syntactic level of description. Surface sentence distribution attains a similar significance level to that of individual results. In a similar manner, it demonstrates that the linguistically less mature children receive more non-canonical and complex structures than the more mature group. On the discourse level there are the predicted significant results which are more related to the behaviour of the less sophisticated listeners rather than to their linguistic needs *per se*.

IV. 1. Words per minute

Table 4.14 shows that none of the three measures used attained significance in one-tailed tests. The trend, obvious in individual results, is repeated here. The teachers devote a slightly larger percentage of interaction to the foreigners and speak marginally slower in AF than AN.

Table 4.14 - Means,(Standard Deviation) and significance of overall teachers' speech rate to N and F.

Teachers' parameters	N	F
% of time	56.33	61.44
	(9.35)	(7.68)
word/minute	108.13	114.20
(Gross Value)	(12.17)	(5.14)
word/minute	193.76	187.24
(Net Value)	(22.25)	(16.79)

IV. 2. Overall Measures

The overall results, similar to individual ones, do not match the prediction of a syntactically more adjusted input to Fs than to Ns. Indeed, both significantly different sets of listeners receive an embarrassingly similar input as shown in Table 4.15. The mean number of utterances per turn which demonstrates the physical distribution of the conversation attains a high level of

Table 4.15 - Overall means, (Standard Deviation) and significance for adult speech to natives (AN) and foreigners (AF).

	Adult Speech Parameters	Pair 2		Pair 3		Pair 5		Overall	
		AN	AF	AN	AF	AN	AF	AN	AF
OVERALL	Mean length of utterance	5.58 (0.61)	5.66 (0.66)	5.14 (0.41)	5.09 (0.34)	5.63 (0.53)	5.80 (0.80)	5.49 (0.54)	5.56 (0.69)
	Mean number of utterances/turn	2.00 (0.35)	1.80* (0.16)	2.22 (0.67)	1.55* (0.11)	2.57 (0.39)	1.84** (0.33)	2.27 (0.50)	1.75*** (0.25)
	Sentence	83.43 (4.58)	86.57 (6.29)	82.80 (3.90)	80.40 (4.77)	73.14 (8.33)	73.29 (10.16)	79.47 (7.63)	80.05 (9.33)
	Fragment	11.43 (3.40)	8.00* (4.16)	8.80 (4.15)	12.80** (4.15)	15.86 (6.84)	16.14 (7.80)	12.37 (5.65)	12.26 (6.55)
	Interjection	5.14 (4.87)	5.43 (3.78)	8.40 (3.29)	6.80 (2.28)	11.00 (2.45)	10.57 (3.69)	8.16 (4.36)	7.68 (3.99)
SURFACE SENTENCE TYPE	Declarative (Total)	35.43 (9.50)	36.00 (4.76)	32.40 (14.79)	18.80 (4.15)	37.57 (12.31)	25.86** (7.76)	35.42 (11.56)	27.74** (9.03)
	Declarative	20.86 (6.31)	22.00 (6.63)	24.40 (14.24)	10.00* (2.00)	16.86 (5.46)	13.57 (5.91)	20.32 (8.81)	15.74* (7.31)
	Deictic	12.86 (8.71)	13.14 (6.31)	4.80 (4.82)	3.20 (5.22)	10.29 (8.03)	6.57 (3.30	9.79 (7.91)	8.11 (6.36)
	Fragment Declarative	1.71 (2.13)	0.86 (1.07)	3.20 (3.90	5.60* (2.61)	10.43 (3.78)	5.71** (2.93)	5.32 (5.11)	3.89 (3.23)
	Imperative (Total)	17.43 (9.57)	18.00 (7.21)	13.20 (8.07)	6.40* (5.37)	2.29 (1.38)	1.43 (1.40)	10.74 (9.62)	8.84 (8.95)
	+ Imperative	11.71 (6.37)	12.00 (5.03)	7.20 (5.02)	5.20 (3.63)	1.29 (1.11)	0.86 (0.69)	6.68 (6.39)	6.11 (6.00)
	- Imperative	0.57 (0.98)	0.86 (1.57)	0.40 (0.89)	0.00	0.00	0.00	0.32 (0.75)	0.32 (1.00)
	Imperative + Subject	4.00 (3.46)	3.71 (3.35)	4.40 (4.34)	1.20* (1.79)	1.00 (1.15)	0.57 (1.13)	3.00 (3.33)	1.89 (2.64
	Fragment Imperative	1.14 (1.57)	1.43 (2.51)	1.20 (1.01)	0.00*	0.00	0.00	0.74 (1.19)	0.53 (1.61)
	Questions (Total)	42.00 (14.33)	40.57 (9.43)	46.00 (11.05)	68.00** (8.60)	49.14 (11.33)	62.14** (8.51)	45.68 (12.18)	55.74** (14.75)
	Wh-question	9.71 (8.75)	11.43 (6.19)	17.60 (5.18)	29.20* (12.93)	11.14 (4.14)	15.00* (4.08)	12.32 (6.94)	17.42 (10.50)
	Wh-final	1.14 (2.27)	0.57 (0.98)	0.40 (0.89)	0.00	0.14 (0.38)	0.43 (0.53)	0.57 (1.46)	0.37 (0.68)
	Auxiliary yes/no	11.71 (2.93)	10.57 (3.60)	13.60 (3.85)	20.40* (6.07)	15.14 (6.52)	20.86 (7.43)	13.47 (4.75)	16.95* 7.48)
	Raised verb	0.86 (1.07)	1.71 (2.43)	0.40 (0.89)	0.00	0.00	0.00	0.42 (0.84)	0.63 (1.64)
	Raised intonation	7.71 (2.13)	8.29 (2.69)	2.40 (1.67)	2.40 (3.29)	6.86 (2.34)	7.43 (2.44)	6.00 (3.00)	6.42 (3.61)
	Declarative + tag	1.14 (1.07)	1.14 (2.27)	4.00 (2.45)	2.80 (1.79)	5.29 (2.36)	4.86 (3.80)	3.42 (2.65)	2.95 (3.15)
	Tag	1.14 (1.07)	1.43 (2.23)	3.20 (2.28)	6.00 (6.78)	5.14 (3.80)	3.14 (3.18)	3.15 (3.08)	3.26 (4.32)
	Fragment Question	8.57 (2.99)	5.43 (2.99)	4.40 (3.58)	7.20** (4.45)	5.43 (4.04)	10.43* (6.73)	6.32 (3.82)	7.74 (5.18)

Legend: +Means, S.D. and significance level computed out of all the sampling period for the three pairs

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$ (1-tailed)

Table 4.15 - Overall means, (Standard Deviation) and significance for adult speech to natives (AN) and foreigners (AF).

	Adult Speech Parameters	Pair 2		Pair 3		Pair 5		Overall	
		AN	AF	AN	AF	AN	AF	AN	AF
COMPLEXITY	Present	65.71 (4.96)	71.43 (10.31)	77.60 (5.90)	69.60 (10.53)	60.71 (18.81)	53.71 (18.53)	67.00 (13.46)	64.42 (15.67)
	Past	6.86 (5.52)	5.14 (5.52)	2.00 (2.00)	6.40 (13.22)	9.71 (10.48)	18.42 (14.97)	6.63 (7.57)	10.37 (12.86)
	Future	10.86 (2.54)	10.00 (4.00)	3.20 (1.79)	4.40 (5.55)	2.71 (5.19)	1.14 (2.61)	5.84 (5.23)	5.26 (5.48)
	Verbless utterance	16.57 (4.58)	13.43 (6.29)	17.20 (3.90)	19.60 (4.77)	26.86 (8.34)	26.71 (10.16)	20.53 (7.63)	19.95 (9.33)
	Multiproposition	8.00 (6.43)	8.29 (4.54)	11.20 (4.38)	10.80 (4.82	9.29 (2.56)	10.57 (2.07)	9.32 (4.68)	9.79 (3.85)
	S/node/sentence	1.10 (0.08)	1.10 (0.05)	1.14 (0.05)	1.14 (0.06)	1.13 (0.03)	1.15 (0.03)	1.12 (0.06)	1.13 (0.05)
DISCOURSE FEATURES	Imitation (Total)	11.14 (4.14)	5.43** (3.95)	4.40 (4.34)	7.20 (3.63)	13.43 (4.30)	9.00* (3.16)	10.21 (5.43)	7.21* (3.74)
	Imitation	3.43 (2.99)	1.43 (1.51)	2.80 (1.79)	4.40* (1.67)	10.86 (4.14)	7.71* (3.04)	6.00 (4.90)	4.53* (3.49)
	Transformed imitation	7.71 (3.35)	4.00* (3.65)	1.60 (2.61)	2.80 (2.68)	2.57 (2.82)	1.29 (0.76)	4.21 (3.95)	2.68* (2.77)
	Correction (Total)	4.29 (2.43)	6.57 (5.13)	5.20 (5.93)	6.80 (3.35)	3.29 (1.98)	7.43* (3.55)	4.16 (3.42)	6.95** (3.95)
	Syntactic	1.43 (2.50)	2.00 (2.00)	0.00	1.20 (1.79)	0.00	0.29 (0.76)	0.53 (1.61)	1.16* (1.68)
	Semantic	2.00 (2.31)	3.14 (2.27)	4.00 (4.90)	4.80 (2.28)	1.00 (1.15)	1.43 (0.79)	2.16 (3.00)	2.95 (2.22)
	Rephrase	0.86 (1.57)	1.43 (2.25)	1.20 (1.79)	0.80 (1.79)	2.29 (1.80)	5.71* (3.20)	1.47 (1.74)	2.84* (3.30)
	Repetition (Total)	18.86 (5.40)	35.43** (7.18)	17.20 (3.35)	26.80* (7.16)	14.29 (7.59)	27.00* (15.11)	16.74 (5.96)	30.47*** (11.37)
	Repetition	7.43 (3.60)	14.29* (6.87)	3.20 (1.79)	8.00* (3.75)	3.29 (2.36)	3.29 (4.42)	4.79 (3.34)	8.58* (7.00)
	Transformed Repetition	5.14 (3.80)	9.71* (5.82)	8.40 (5.37)	9.60 (3.58)	5.71 (4.61)	13.43* (8.06)	6.21 (4.49)	11.05** (6.26)
	Paraphrase	6.29 (1.80)	11.43* (3.60)	5.60 (0.89)	9.20** (2.28)	5.29 (4.64)	10.29** (4.57)	5.74 (2.94)	10.42*** (3.64)

Legend: +Means, S.D. and significance level computed out of all the sampling period for the three pairs

*$p \leq .05$ **$p \leq .01$ ***$p \leq .001$ (1-tailed)

significance. AF contains significantly fewer utterances than AN. Teachers, therefore, request more frequent contributions from foreigners than natives, probably because the former are less successful in filling up their turns than the latter.

IV. 3. Surface Sentence Type

Five out of eighteen variables show significant differences between AF and AN (Table 4.14).

i - Declarative (Total)

The grand means and one of their sub-components (declaratives) display significant differences between AN and AF. While this result is in line with findings in other studies of fewer declaratives to the younger child, it is in direct contrast to the fine-tuning prediction. The linguistically naive listeners receive significantly fewer canonical structures than the more mature ones.

ii - Imperative (Total)

There is no significance on the variables investigated although the grand mean of AF shows a tendency to include slightly fewer imperatives than AN. However, AN contains slightly more undeleted surface components (imperative and subject) than AF. Yet the behaviour of this variable is not consistent since its standard deviation in both AN and AF is high and is almost as large as the mean.

iii - Questions (Total)

The grand means and two of their sub-variables (wh- and auxiliary inverted yes/no questions) reveal a significant difference between AN and AF. Although these findings substantiate previous reports of more questions when the child is younger, they clash directly with the hypothesis of syntactically simpler inputs to the simpler learners. The three foreigners receive significantly more rearranged and complex structures than the three natives.

IV. 4. Complexity Measures

Similar to individual pair results, not one of the six measures of syntactic complexity displays significant differences between AN and AF. On the contrary, AF seems to be more complex than AN, containing more past tense reference and fractionally more multipropositional constructions (Table 4.14).

IV. 5. Discourse Measures

As previously reported (in this study and in the literature) the discourse level of description shows the most significant type of adjustments to the listeners. Ten out of eleven variables register significant differences between AN and AF. The direction of difference is also as predicted. Fs receive significantly more corrections and repetitions while Ns receive significantly more imitations.

In general, then, these results do not seem to match the predictions made at the start of the study. We now turn to a preliminary attempt to put such unexpected findings into perspective.

V. Discussion and Conclusion

As we have seen, the results of comparing AF with AN are generally difficult to reconcile with a fine-tuning position and with the expectations of the literature. However, if we look at the separate results for each child individually, we will see that these are in line with those descriptions provided by other workers which led to the formulation of the hypothesis. Thus we may conclude that the hypothesis, while providing an appropriate description of motherese features for each child individually, is not well supported when the linguistic level of the child is tested as an independent variable. However, the main question is not whether motherese features actually occur in speech addressed to children. They do. The question is whether it is the child's linguistic needs which produce and control motherese. This section attempts to further explore these findings in this study and to pave the way for a reassessment of the motherese phenomenon. First we will look at individual results and then at comparative results.

V. I. Individual Results

The current experiment matched children of similar ages, but of significantly different linguistic abilities in order to test the

fine-tuning hypothesis. The hypothesis explains the nature of differences between adult to adult (A/A) and adult to child (A/C) speech to be the result of quite fine syntactic adjustments dependent upon the nature of the child listener. The many motherese characteristics have been considered to render A/C simpler than A/A and in Furrow et al.'s (1979) view to make A/C 'an effective teaching language'. However, as Newport et al. (1977) point out, the wide-ranging sentence types as well as the frequency of non-canonical structures make A/C psycholinguistically more complex than A/A. According to the authors, then, motherese can hardly be said to arise from a syntax-teaching function or to be finely-tuned to the learner's needs (also, Shatz and Gelman 1977).

In an attempt to explain A/A and A/C differences, Newport et al. proposed the multi-factor hypothesis which states that motherese features are the by-product of conversing with and controlling the behaviour of the linguistically and cognitively immature listener rather than the product of a teaching function. In that sense, the multi-factor hypothesis explains the presence of some sentence types (e.g. imperatives) and the findings for the discourse level of description, but does not account for other syntactic features such as low mlu, low propositional complexity, frequency of questions and scarcity of declaratives, etc. It was in this area of syntactic adjustments that significant differences between the two significantly different listeners were expected to yield the greatest support for the fine-tuning hypothesis.

While the findings reported above are unexpected, individual

child results agree with previous reports and description in the literature. As mentioned earlier in this chapter (Sections III.A.2; B.2; C.2), the range of teachers' mlus to each pair-member is corroborated by at least one of the published data for the comparable age groups investigated (Chapter Two, Table 2.1). In general, Fraser and Roberts' (1973) values are in line with the findings of this study. Moreover, each child receives a short mlu, on average less than three words longer than his own output, confirming thereby Cross' (1977) observation. Each child receives a high percentage of grammatically well-formed utterances, on average between 79.47 and 80.05 (Table 4.14). Input to each listener in the three age-pairs has frequent instances of brief and abbreviated utterances. Fragments are 12.26 to 12.37 on average while interjections range between 7.68 to 8.16. The results for fragments are less than Snow's (1972) 16% and Newport's (1976) 17%. When fragments and interjections are taken together (19.94 for AF and 20.53 for AN) they are slightly higher than Cross' (1977) value (18%), but are comparable to Furrow et al.'s (1979) figure of 20.6%.

Previous research also endorses estimates reported in this study for other features of input to each of the six children. Declaratives (total) range between 27.74 and 35.42 (for AF and AN respectively as in Table 4.14) and fall between Furrow et al.'s report of 25% and Newport's of 37%. Imperatives (total) for AF and AN (8.84 and 10.74 respectively) agree with Cross' figure of 7.4% and Rondal's (1980) meal situation (11%). The total number of questions tends to be higher for the foreigners as well as for the

natives (55.74% and 45.68% respectively) than in previous reports, such as Newport's (44%). However, measures of syntactic complexity are in line with published data. S-nodes per sentence are 1.13 in AF and 1.12 in AN and are close to Newport's value of 1.16.

Discourse features are also confirmed by other studies. Imitations (total) range between 7.21 for AF and 10.21 for AN and are roughly comparable to Newport's figures (11%). The total number of repetitions varies between 16.74 for AN and 30.47 for AF which is slightly higher than Cross' result of 28.2%. While the total number of corrections (referred to in the literature as expansion or extension) is somewhat comparable to Newport's 5% value (AF is 6.95 and AN is 4.16), Brown and Bellugi's (1964) result of 30% remains the highest in the literature (Chapter Two, II.3.C). Finally, the total number of repetitions in AF is 30.47% and is marginally higher than 28.2% in Cross' study whereas AN is 16.47% and is similar to Harkness' (1977) result.

Thus we see that although individual child results are similar to previous data and descriptions in the literature, comparative results between and across the two types of addressees are not in line with the standard view. It has been possible to observe this thanks to the matching design of the present research which isolates the potential variable, a design which is new to the field. In addition, the longitudinal methodology of sampling speech from the same adult and the classification of variables into sub-variables, both refinements of previous studies, have also contributed to a seemingly disorderly pattern of results which do

not match the fine-tuned predictions. It is to these comparative results that we now turn for further analysis.

V. 2. Comparative Results

According to the fine-tuning hypothesis adults finely control the complexity of their speech by remaining just 'one step ahead' of the children's speech. The size of the step according to Cross (1977 p.172) is on average less than three morphemes longer than their children's mlu, exhibiting 'a very regular "catching up" effect' as the child approaches his mother's level of linguistic maturity. As each age-pair member in this study had a highly significantly different mlu, teachers' mlus for each age-pair member should have been less than three morphemes or words longer for each listener,and in turn, highly significantly different mlus should have been found in comparing AN to AF. Unfortunately, this is not the case for any of the age-pair adult mlu results nor is it the case for the three pair-members in overall adult speech mlu results. Indeed, teachers' mlus in AF are fractionally longer than their mlus in AN. Contrary to the fine-tuning hypothesis, then, adults cannot finely tune their speech to remain within the 'reach' of their listeners and neither can their listeners' stages monitor adults' input. This is a serious blow to the hypothesis. The results mean that adults cannot provide graded models systematically expanded to accommodate the child's growth. Short mlus do not seem to be listener- or stage-dependent characteristics and seem to remain quite insensitive to children's maturity across the three age-pairs. That is, mlu fails to rise, even with the

ages of the children. The other overall measures also show no differential treatment for the addressees' needs (except MUT which will be discussed below).

The above results gain force from the pattern repeated on other measures of syntactic complexity used in this study. As the two types of addressees differed significantly in linguistic stages, it was expected that the less mature listeners would receive significantly less complex input than the more mature ones. Overall results for the six parameters reflect the pattern for individual age-pair results where no significant differences are recorded between AF and AN. Both addressees receive surprisingly similar inputs in terms of tense, verbless utterances and sentence complexity. On these measures, neither the fine-tuning nor the multi-factor hypothesis is supported, and neither suggests what variable controls motherese characteristics.

Furthermore, adults' surface structure complexities do not match fine-tuning expectations. It has been stated in Chapter Two (II.2.C.ii) that the wide-ranging sentence types which move or delete surface constituents (interrogatives and imperatives) obscure the canonical form of the English sentence making deep structure recovery difficult (Newport, 1976). It has also been stated that researchers seem to have ranked wh-questions as the most complex of interrogative sentences from a processing and acquisition point of view (Gleason, 1973; Clark and Clark, 1977). If the complexity of adults' syntax is appropriately tuned to the child's level and linguistic requirements, then complex

interrogative sentences in general, and wh-questions in particular, should be proportionately fewer to the linguistically naive member of the pair. Unfortunately, this is not the case. Foreigners receive significantly fewer canonical structures and significantly more non-canonical ones (especially wh-questions) than the natives.

Moreover, Cross (1977) had argued that raised intonation yes/no questions are less complex and better adjusted to the child's interpretation strategies than auxiliary inverted yes/no questions. Raised intonation questions avoid interruption or rearrangement of linguistic units whereas auxiliary fronted ones defy such a principle. According to this criterion of simplicity, auxiliary inverted yes/no questions are expected to be less frequent to the foreigners whereas raised intonation questions are expected to be greater in number. However, the results do not substantiate such fine-tuned expectations. AF contains significantly more complex structures (auxiliary fronted yes/no questions) than AN, whereas both AF and AN have almost the same mean percentage of the raised intonation type.

Brown and Bellugi (1964) had identified the wh-final question (or occasional question) as of particular didactic value in teaching the membership of constituent sentence units. If motherese features do indeed arise from a syntax teaching function - as the fine-tuning hypothesis argues - than an abundance of this particular sub-variable of questions is expected in speech to these children and a significant frequency is predicted for the foreigners. Nevertheless, neither of these expectations is

satisfied. Together with the raised verb type, occasional questions are quite rare in input to the children. Surprisingly too, the linguistically more proficient child receives slightly more examples of the supposedly didactic type of questions than the less proficient child. Results of surface sentence complexity argue for Newport et al.'s communicative, rather than didactic, interpretation of input features. Indeed, the density of the conversational structure as measured by MUT (mean number of utterances per turn) supports a communicative position. MUT is consistently and significantly shorter in AF than in AN. Taken together with the significantly higher proportion of questions in AF than in AN, the finding shows that foreigners are more frequently requested to communicate than the natives, who presumably contribute readily without much coaxing. This interpretation is further confirmed by the significantly higher percentage of repetitions in AF than in AN. It is sensible to conclude that adults would feel nervous if their listeners did not answer their requests and so tend to repeat them. Every repetition amounts to a renewed opportunity to speak or a renewed turn and therefore fewer utterances per turn to the foreigners.

It follows, then, that if motherese had been governed by an adjustment to processing or syntactic ease, or if input had been uniformly pitched just a step ahead of the child's level or if motherese had been controlled by the child's linguistic stages, at least some of the fine-tuning syntactic expectations or arguments would have been met. We have no evidence at all that that is the case on the syntactic level of description. Furthermore, input

features seem even insensitive to the children's maturity levels. Longitudinal records (Appendix H) and overall results (Table 4.14) exhibit a negligible change in syntactic complexity measures over the three age-pairs. The lack of an increasing or decreasing pattern, on its own, defies any claim about a 'systematic change' in the linguistic environment concommitant with changes in the child's abilities. However surprising this result is, there are at least two studies which corroborate it. Cross (1977) found no significant correlation with age for declaratives, deictic statements, imperatives, questions (except wh-questions) and S-nodes per utterance. Save for declaratives and imperatives, Newport (1976) found no significant correlation (either way) for deixis, wh-questions, yes/no questions, S-nodes per utterance, complete sentences, fragments and interjections. Consequently, a syntactic hypothesis is not substantiated by those results.

Finally, findings on the discourse level of description match both the didactic and communicative hypotheses. They also show a significant differential treatment according to the nature of the addressees. As stated in Chapter Two (Table 2.5), three studies make contradictory predictions as to the direction of difference vis-à-vis linguistic abilities. Cross (1977, 1979) reports significant negative correlations between imitation and child's mlu. When applied to the present design, the linguistically naive listener should receive significantly more imitations. However, Wells' (1980) results for this variable are just the opposite of Cross'. According to Wells' results then, the foreigners in this study would receive significantly less imitation than the natives.

In the formulation of discourse predictions it was reasonably assumed that since the foreigners were less proficient than the natives, their teachers would have fewer opportunities to imitate or reinforce their utterances and rather more opportunities to correct their contribution. Although the thrust of such a prediction is a didactic one, it also fits with a communicative approach. The less talkative of the pair (linguistically limited listener), the more attempts at engaging him in verbal communication and the more frequent repetitions he will receive; whereas the more talkative the child (the native) the more attempts at reinforcing or acknowledging his contribution by imitation. In fact, overall results reflect individual ones where significant differences between AN and AF were obtained in the predicted direction.

In conclusion, we may say that we are left with a very confusing picture. Our individual results fit the difference in the literature of A/C speech with A/A speech. This would confirm that individual AF and AN speech exhibit motherese features. However, our comparative results reveal that, in general, significant differences between AF and AN speech do not appear, and in the few instances when they do, they appear in the wrong direction: away from a theoretically simple input.

So, motherese features do not seem to be the result of the listener's linguistic needs. What, then, produces and controls motherese? In the next chapter, a new hypothesis is formulated and tested which suggests an answer to this conundrum.

CHAPTER FIVE - A Functional Hypothesis

I. Introduction

This chapter reassesses the phenomenon of child-directed speech known in the literature as motherese. As we have seen in the previous chapter, the few significant differences between input to foreigners and input to natives are not geared towards what represents a theoretically simple input and do not support the fine-tuning hypothesis. The significantly different stages of the addressees do not seem to exert the previously assumed control over the syntactic features of motherese. Something else does. Indeed, the findings reported in Chapter Four yield an incomplete view of what might be the independent variable(s) in motherese research. Furthermore, if certain features of A/C are counterproductive to language acquisition or are negatively correlated with progress as suggested by researchers (Granowsky and Krossner, 1970; Newport et al., 1977; De Paulo and Bonvillian, 1978; Furrow et al., 1979), then it becomes all the more important to ask why these occur in the first place. Therefore, discovering the factor(s) responsible for A/A and A/C differences would enable us to present a more coherent interpretation of results in this study and of other current findings in the field.

This chapter attempts a reanalysis of the motherese phenomenon. It presents, argues for, and to some extent tests, a new functional hypothesis which can explain both the negative results obtained in Chapter Four and the fact that A/A and A/C differ. Part II

develops the hypothesis and in Part III it is tested using the data obtained in the longitudinal study of age-pair design. Part IV investigates the validity of this new hypothesis in adult-to-adult speech. Part V demonstrates how previous reports in the field had been subject to an artifact created by inappropriate comparisons.

II. A. The Functional Hypothesis

The hypothesis states that motherese varies according to the purpose/function of the adult speaker in a given situation. This position maintains that sundry syntactic and discourse features of motherese are governed by the conversational function and purpose of the adult's speech.

The hypothesis stems from three sources. The first source lies in the unsuccessful attempts of several theorists to describe and fully account for the motherese phenomenon. The received view is that motherese is 'admirably designed to aid children in learning language' (Snow, 1972, p.564) and is therefore 'an effective teaching language' (Furrow et al., 1979, p.440). This stance argues that syntactic simplifications are teaching strategies or 'tutorial devices' which convey information to the child about the syntax of his language (Gleason, 1973; Levelt, 1975; Cross, 1977; Rondal, 1980). This fine-tuned interpretation therefore claims that the linguistic needs and abilities of the learner determine sundry motherese features. However, as Newport et al. have argued, this hypothesis does not account for the wide-ranging surface sentence distribution and the psycholinguistically complex

structures produced to children learning syntax. Nor does it account for the lack of significantly simpler input to the linguistically immature subjects in this experiment. Other researchers (Newport, 1976; Newport et al., 1977; Shatz and Gelman, 1977) have argued that motherese arises from a multiplicity of purposes designed to control the behaviour of a linguistically and cognitively immature listener. This hypothesis attributes A/A and A/C differences to differences in conversational status, age and language abilities of the addressees, adult versus child. Further elaborations are provided by Brown (1977) and Snow (1977b). For these authors, motherese arises from the adult's need to carry on effective communication with children in the here-and-now. Although this position explains the underlying intent of child-directed speech, it does not investigate the variables causing the emergence or disappearance of sundry motherese features.

The second source of observation lies in the previously unnoticed characteristics of typical mother-child interactions. In Chapter Two the discussion highlighted the fact that great variations found both within and across studies for the results of certain motherese parameters (rate of speech, disfluencies, mlu, propositional complexity, surface sentence distribution and even discourse) weaken a fine-tuned or even a multi-factor hypothesis. It was argued that if input features do indeed arise from teaching or directive purposes, they should fall within narrowly circumscribed range values defined by the stages or ages of addressees within and across studies. The discussion suggested

that something other than the child's attributes must be involved in the emergence of motherese features. Chapter Two (II.1.d and f; II.2.a, b and c; II.3.a and b) spotlighted the significant effects occurring according to the speech event or task (storytelling or free play) directed to the same listeners. Similar significant results to the same listeners in different situations were also emphasized in the review of non-mothers' speech studies and in the research of teachers' speech to foreigners (Chapter Two, III.C.1; IV.1, 2.a and b; IV.3.a. and b, respectively).

The third and most important source concerns the repeated observation in the present transcriptions of a type of speech used by the teachers and addressed to both children in their pairs (AB hereafter). AB occurred naturally and without any interference on the part of the experimenter. In the initial coding and analysis of the data, AB or speech to both listeners, was included in the 50 utterances tally for each pair member. This meant that there were instances where 50 utterances to one child consisted exclusively of AB while the 50 utterances to the other would be a mixture of speech directed to an individual child and to both children. However, in the repeated coding and analysis of the data it was noticed that AB occurred in specific situations and had a different function from that of adult speech to either foreign child (AF) or adult speech to the native child (AN). Dissatisfied with the disproportionate interference of AB in the tally of each pair member and aware of its different function, we found it imperative to re-code the longitudinal transcripts, differentiating the two types of speech. The results reported in Chapter Four are of

speech clearly intended for the individual child (AF or AN), and the results reported in this chapter are of speech clearly intended for both children (AB). As we shall see, analysis of AB yielded different results from the analyses of AF and AN.

The present hypothesis combines these observations into a description of conversational purposes. If motherese serves many functions and if the linguistic qualities and quantities of parents' language change from one situation to another (as reported by Rondal, 1980) and if particular speech functions occur in particular situations, then speech functions may be the factor which dictates and controls motherese. Kary (1981) tested this hypothesis in a chi-squared test of association run on a limited data sample for the six children. The two conversational functions were defined as +Activity situation, where the focus of adult/child speech was on the physical event and the verbal interaction, as in free play. In -Activity situation, the focus was on non-physical events where the teacher led the interaction. The results showed that within the same situation there was almost no effect for the linguistically different addressees, whereas across-situation comparisons to the same addressee exhibited significant associations.

The longitudinal analysis of instances of AB as separate from AF or AN identifies two major conversational functions which we have defined as Expressive / Informative discourse and Responsive / Interactive discourse. In Expressive / Informative speech, the speaker is primarily interested in communicating or passing

information to his listener(s). This information may be concerned with a wide range of topics: from an identifiable object or referent, or the narration of an event or a process to discussion of an abstract relationship or the expression of a personal state. In expatiating on the message or information to be communicated, the speaker is expected to dominate the conversation, directing / commanding the attention of the listener(s) and conceding very few speaking turns to the interlocutor(s). The demands which this type of speech makes on the listener(s) are intellectual rather than linguistic or verbal per se. It is associated with situations in which the addressor is an active participant and the addressee an attentive listener, such as in a lecture or a lesson, a description or narration and storytelling. Speech addressed to both children (AB) is most closely associated with the expressive / informative conversational function. As the speaker tends to speak in monologue, we shall refer to this function as Type I; I being symbolic of the dominance by one speaker.

In Responsive/Interactive speech, the speaker is principally interested in responding to and eliciting communication from his listener. To some extent, the listener is dominant in this sort of interaction since his verbal/physical response determines what happens next when the speaker, in turn, assumes a responsive attitude. In the process of eliciting conversation, the speaker asks many questions; questions which request information from the addressee to involve him in the interaction, or even questions which request clarification of some new information or of information lost in the interaction. In this case, the speaker

concedes very frequent speaking turns to the listener. The demands which responsive / interactive discourse places on the addressee are mainly verbal or linguistic since the addressee is requested to be an active participant. This speech occurs in situations which require active involvement from participants, generally in physical activities, such as group events, games, free play, etc. Speech to and with individual listeners, as in AF and AN, clearly exhibits this joint partnership between addressor and addressee. As the function of speech involves equal participation in a dialogue we shall, in future reference, call it Type II speech. In this case, II sympolizes the fact that more than one speaker contributes equally to the conversation.

If these two speech types can be identified independently of the measures described in Chapter Three, then we can assign parts of the teacher's speech to these two types and examine the measured parameters for differences. In particular, we can make the following comparisons:

1. Comparison of input to native and foreign children within the same speech type. As type is held constant, the two samples should show few significant differences on input parameters. The independent variable in this case is the linguistic sophistication of the child listener and we claim that this variable does not affect speech measures. (Chapter Four showed very modest differences for comparisons carried out between AN and AF.)

2. A comparison of input to the native child across the two speech types. As type varies, we should find significant differences on various parameters for the same child. The independent variable in this case is the type of speech addressed to the native child and we claim that this variable does affect speech parameters.

3. A comparison of two types of speech to the same foreign addressee should also show significant differences on various parameters. The independent variable is once more the type of speech and the hypothesis predicts significant effects for this variable.

4. Differences in formal and discoursal features to the two different addressees across the two different types of speech should be found on the same parameters and are expected to be of comparable size. This predicted pattern of results should lend further corroboration to the functional hypothesis. In that sense, AB would not be near the lowest common denominator or AF, nor would it be an average between AN and AF; rather, AB parameters would be distinctly outside those of either AN or AF and somewhat close to the parameters of A/A (adult-to-adult speech).

5. A similar pattern of significant results should

be obtained in comparing adult-to-adult speech across the two types of speech. Such results would further confirm the hypothesis.

II. B. Procedure

Theoretically speaking, if the fine-tuning hypothesis had been supported, it would have been awkward to speak to two children of different abilities at once. However, there were frequent instances of such an occurrence. Due to their different functions, speech to both children had to be isolated from speech to each child. Type I or AB was separated from Type II or AF and AN guided by the following criteria:

i. The adult speaker would usually mark AB by such inclusive expressions as: 'both', 'now you two', 'let's all', 'together'.

ii. Alternatively, the speaker would not mark the individual addressee: AB speech shows an absence of vocatives, of reference to the behaviour of a particular addressee and a failure to engage either child in direct communication.

iii. Notes on the transcription provided situational evidence that the speaker was addressing both children together. At all times during the monthly interviews the investigator was present and described directly into the microphone the setting, the event

and its participants.

The reliability of the classification was tested by submitting portions of each type of speech to the judgement of adult native speakers of English. These are contained in Appendix I and include excerpts from Type I and Type II of speech to the six children and of the three teachers' speech to their peers. Six post-graduate native English speakers from various disciplines (2 in literature, 1 linguist, 1 lawyer, 2 biologists) took part in the experiment. The instructions were to mark the types of speech according to their characteristic functions. Numeral one was to be assigned to segments of speech where the speaker is mainly interested in relating information and dominates the conversation in order to do so. Numeral two was to be assigned to segments of speech where the speaker is mainly interested in the contribution of his listeners and speaks largely in response to them (see Appendix I).

The text of the experiment (Appendix I) included 56.25% of Type I speech and 43.75% of Type II. Scoring the behaviour of the six native speakers of English was done in the following manner. On a separate text of the experiment, the investigator classified the extracts into Type I or Type II. Scores for each judge were obtained by rating their agreement with the investigator's classification. A mean agreement was subsequently obtained which was high, 87% with a standard deviation of 5.93.

Appendix J presents longitudinal records of AB or Type I for each age-pair. The criterion of 50 utterances from every time point

was adhered to in order to avoid a sampling bias. Monthly samples fewer than 50 utterances were judged as insufficient records and were not included in the data. It was this initial selection of 50 utterances which first alerted the investigator to the internal changing conditions of discourse and which contributed to the central observation of this thesis. The parameters used in testing the functional hypothesis are the same as the ones used in Chapter Four in investigating the fine-tuning hypothesis.

Appendix K presents the results of correlated subject design statistics which tested the functional hypothesis for each age-pair. Means, standard deviations and significance levels for comparisons across two types of speech to the same listener (native and foreigner respectively) are reported for each age-pair. So the addressee is held constant while type of speech varies. As predicted in 2 and 3 above (II.A), the independent variable of types of speech is the factor which affects speech paramaters. Significant differences are obtained in comparisons across the two types of speech to the same addressees; AB in comparison with AN and AB in comparison with AF. It is to the overall results in support of the functional hypothesis that we now turn.

III. Overall Results and Discussion

This section tests the functional hypothesis across the three age-pairs. Correlated subject design was carried out on AB versus AN and AB versus AF in the three age-pairs. To a great extent, overall analysis reflects individual results obtained in each

age-pair and presented in Appendix K. The predictions made in II.A are supported at a highly significant level. The values of AB fall outside the average for AN and AF, making AB distinctly different from either AN or AF. When the type varies and the addressee is held constant, motherese-like effects occur to the same listeners across two functionally different types of speech. Such results argue against both the fine-tuning and multi-factor hypotheses which regard motherese effects to be the product of either the linguistic stages or the ages of the addressee. On the other hand, the findings substantiate the functional hypothesis in general.

III. 1. Overall Measures

In line with the expectations of the functional hypothesis, syntactic parameters change dramatically as a function of discourse rather than as a function of the addressee as had been claimed by the fine-tuning hypothesis. As reported in Chapter Four, except for mut (mean number of utterances per turn), none of the overall syntactic measures showed significant differences between AN and AF when the linguistic level of the listeners was the independent variable. However, when the addressee was held constant and the type of speech varied, as in the present experiment, all the parameters under this heading exhibited significant effects for the independent variable.

The results reported in Table 5.1 show that AB is significantly greater than either AN or AF. In informative / expressive speech (Type I or AB), the native addressees receive, on average,

Table 5.1 - Means, (Standard Deviation) and significance levels for overall and individual results of overall measures in comparisons between AB versus either AN or AF

Group & Single Analysis	Speech Category	Adult Speech Parameters				
		MLU	MUT	Sentence	Fragment	Interjection
Overall	AB	8.33 (1.33)	3.27 (1.19)	92.13 (4.02)	5.20	2.66
	AB/AN	5.49*** (0.54)	2.27*** (0.50)	79.47*** (7.63)	12.37** (5.67)	8.16*** (4.36)
	AB/AF	5.56*** (0.69)	1.75*** (0.25)	80.05*** (9.33)	12.26*** (6.55)	7.68** (3.99)
Pair 2: 26 to 32 months	AB	7.69 (1.14)	2.61 (0.57)	88.50 (1.00)	8.50 (2.52)	3.00 (2.58)
	AB/AN	5.58** (0.61)	2.00* (0.35)	83.43 (4.58)	11.43** (3.40)	5.14 (4.87)
	AB/AF	5.66* (0.66)	1.80* (0.16)	86.57 (6.29)	8.00* (4.16)	5.43 (3.78)
Pair 3: 35 to 39 months	AB	7.36 (0.97)	2.89 (0.86)	93.60 (3.85)	4.40 (3.85)	2.00 (1.41)
	AN	5.14** (0.41)	2.22* (0.67)	82.80** (3.90)	8.80* (4.15)	8.40* (3.29)
	AF	5.09** (0.34)	1.55** (0.11)	80.40** (4.77)	12.80** (4.15)	6.80** (2.28)
Pair 5: 66 to 72 months	AB	9.56 (0.59)	4.03 (1.43)	93.33 (4.27)	3.67 (3.01)	3.00 (2.76)
	AN	5.63*** (0.53)	2.57* (0.39)	73.14** (8.33)	15.86** (6.84)	11.00** (2.45)
	AF	5.80*** (0.80)	1.84** (0.33)	73.29*** (10.16)	16.14** (7.80)	10.57** (3.69

Legend: AB: Adult speech Type I to children
AN: Adult speech Type II to native
AF: Adult speech Type II to foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

significantly longer mlu (8.33) than in responsive/interactive speech (Type II or AN) which is 5.49. The native addressees also receive significantly longer muts, a greater number of complete sentences and significantly fewer fragments and interjections in AB than in AN. The finding is also confirmed in comparing informative / expressive speech with responsive/interactive speech to the foreigners. The foreign addressees receive significantly different inputs depending on the function of adult speech to them. AB is, on average, significantly longer (mlu is 8.33) than AF (5.56). AB has significantly longer muts, a greater number of complete sentences, a significantly smaller number of fragments and interjections than AF. These results argue that input is not systematically tuned to the addressees; rather it is systematically adjusted to the type of interaction adults chose to have with their interlocutors.

Although this conclusion seems radical within the received view of a fine-tuned or multi-factor hypothesis, data reported by previous researchers -- although not their interpretations -- support the above conclusion. A short mlu is the measure upon which the fine-tuning hypothesis rests and the measure itself allows direct comparison with previous studies. Table 2.1 (Chapter Two) presents mlu results over several studies and several ages. A rapid perusal of that table shows that Fraser and Roberts (1973) reported two different mlu values for the same children depending on the type of task around which speech was structured. The storytelling task (which is comparable to our Type I speech) had a longer mlu (5.5, 9.0, 9.0, 8.8) than mlu in structured play (comparable to our Type II speech) (5.0, 6.4, 7.0, 7.5) for the following children's ages in

months: 18, 30, 48, 72 respectively. Futhermore, Fraser and Roberts' ANOVA shows a highly significant effect for the nature of the task ($p<.001$). In a similar manner, Rondal's ANOVA shows 8 highly significant effects for the speech situation variable, mlu being one of them. Moreover, Henzl's results -- not her interpretation -- for teacher's speech (Chapter Four, IV.2.a) show a dramatic change in length according to the task around which speech is structured. The functional hypothesis, therefore, gains force not only from the corroboration of results obtained in this study in comparisons across types of speech to the two addressees but also from published but discounted data of previous researchers. The factor which we have been trying to identify in Chapters Two and Four and which controls the length of utterances and, indeed, the overall syntactic features of input is the nature of discourse that adults wish to communicate to their addressees.

It is worth mentioning that the size of significant results between AB and either AN or AF is impressive. As AB is informative / expressive speech addressed to both listeners, we would have expected, according to the literature and the fine-tuning position, that AB would be something akin to speech to the less able child (foreigner) or, at least, would fall between the values of AN and AF. Had such a pattern been obtained we could have still maintained a fine-tuning argument. With the findings in Table 5.1, we cannot. The parameters of AB are significantly outside those for either AN or AF. Furthermore, the range of mlu in individual and overall AB results is within the range of Fraser and Roberts' comparable speech event of storytelling. Indeed, AB's mlu (8.33) is almost identical

to Phillips' (1973) A/A (adult-to-adult) mlu results of 8.37. In both cases, mlu of A/A and of AB are significantly greater than mlu of A/C (adult speech to children) and of either AN or AF. In fact, in its other features, AB seems close to A/A. Both Newport (1976) and Phillips reported interjections and fragments to be significantly fewer in A/A than in A/C. In a similar fashion, interjections and fragments are significantly smaller in number in AB than in either AN or AF.

Finally, the two types of functions also dictate the physical distribution of speech. In Type I, the speaker tends to dominate the conversation and holds the floor long enough to expatiate on his message. In Type II, the speaker is mainly interested in eliciting conversation and so yields the floor frequently. The results in Table 5.1 demonstrate that the number of utterances before a turn is conceded is significantly greater in AB than in either AN or AF. It is unfortunate that we have no comparable data for this measure in A/A, but it is expected that adults, especially in Type I, would display behaviour consistent with the current observation.

In short, then, overall significant results for AB comparisons with either AN or AF reflect individual significant results obtained for each age-pair. Only sentences and interjections in age-pair 2 fail to reach significance in such comparisons. In general, the predictions of the functional hypothesis have been satisfied.

III. 2. Surface Sentence Type

The highly significant results for the distribution of AB versus AN or AF confirm the hypothesis that the function of speech controls sentence forms and creates motherese-like effects on this parameter. We should recall that there were 5 overall significant differences between AN and AF and none of them was in the direction of significantly simpler input to the significantly simpler listeners. As shown in Table 5.2, there are 11 overall significant differences for the same native addressees between AB and AN. A similar number of significant differences occur in comparison across the two types of speech (AB versus AF) directed to the same foreign listeners. The size of significant differences between AB and either AN or AF establishes AB as remarkably different from either AN or AF and somewhat similar to A/A.

i. Declarative (Total)

The grand mean of AB contains significantly more non-deformed structures than the grand means of either AN or AF. This is the kind of result we had hoped to find between AN and AF in order to support a fine-tuned position. What we found is the reverse. The linguistically naive children receive significantly more canonical sentences than the natives not according to their age-match, but rather according to the different functions of speech they are exposed to. The same result also applies to the native listeners. Table 5.2 shows that declarative (total) and its major sub-component (declarative) are significantly greater in number in AB than in either AN or AF, while deictic and fragment declaratives are not. However, deictics in AB are in the predicted direction outside the

Table 5.2 - Means, (Standard Deviation) and significance levels for individual and overall results of surface sentence type in speech type comparisons between AB and either AN or AF.

	Adult Speech Parameters	Pair 2: 26-32 months			Pair 3: 35-39 months			Pair 5: 66-72 months			Overall		
		AB	AN	AF	AB	AN	AF	AB	AN	AF	AB	AN	AF
Surface Sentence Type	Declarative (Total)	48.00 (12.11)	35.43* (9.50)	36.00 (4.76)	51.60 (14.79)	32.40** (14.79)	18.80** (4.15)	74.33 (8.59)	37.57*** (12.31)	25.86*** (7.76)	59.73 (16.57)	35.42*** (11.56)	27.44*** (9.03)
	Declarative	38.50 (11.36)	20.86* (6.31)	22.00** (6.63)	41.60 (13.89)	24.40** (14.24)	10.00* (2.00)	50.83 (3.31)	16.86*** (5.46)	13.57*** (5.91)	44.47 (10.82)	20.32*** (8.81)	15.44*** (7.31)
	Deictic	6.00 (3.27)	12.86 (8.71)	13.14* (6.31)	6.40 (4.34)	4.80** (4.82)	3.20 (5.22)	20.17 (8.82)	10.29** (8.05)	6.57** (3.30)	11.87 (9.24)	9.79 (7.91)	8.11 (6.36)
	Fragment Declarative	3.50 (2.52)	1.71 (2.13)	0.86 (1.07)	3.60 (3.85)	3.20 (3.90)	5.60 (2.61)	3.33 (2.34)	10.43** (3.78)	5.71** (2.93)	3.47 (2.75)	5.32* (5.11)	3.89 (3.23)
	Imperative (Total)	22.50 (7.19)	17.43* (9.57)	18.00 (7.21)	13.20 (11.37)	13.20 (8.07)	6.40 (5.37)	2.00 (2.09)	2.29 (1.38)	1.43 (1.40)	11.20 (11.12)	10.74 (9.62)	8.84 (8.95)
	+ Imperative	19.50 (7.72)	11.71 (6.37)	12.00 (5.03)	11.60 (9.84)	7.20 (5.02)	5.20 (3.63)	2.00 (2.09)	1.29 (1.11)	0.86 (0.69)	9.87 (9.80)	6.68* (6.39)	6.11* (6.00)
	- Imperative	0.00	0.57 (0.98)	0.86 (1.57)	0.00	0.40 (0.89)	0.00	0.00	0.00	0.00	0.00	0.32 (0.75)	0.32 (1.00)
	Imperative + Subject	1.00 (1.15)	4.00 (3.46)	3.71 (3.35)	0.80 (1.79)	4.40* (4.34)	1.20 (1.79)	0.00	1.00* (1.15)	0.57 (1.13)	0.53 (1.19)	3.00** (3.33)	1.89* (2.64)
	Fragment Imperative	2.00 (1.63)	1.14 (1.54)	1.43 (2.51)	0.80 (1.10)	1.20 (1.01)	0.00	0.00	0.00	0.00	0.80 (1.26)	0.74 (1.19)	0.53 (1.16)

Legend: AB = Adult Speech Type I to Children
AN = Adult Speech Type II to Native
AF = Adult Speech Type II to Foreigner

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

Table 5.2 - (cont'd) Means, (Standard Deviation) and significance levels for individual and overall results of surface sentence type in speech type comparisons between AB and either AN or AF.

	Adult Speech Parameters	Pair 2: 26-32 months			Pair 3: 35-39 months			Pair 5: 66-72 months			Overall		
		AB	AN	AF	AB	AN	AF	AB	AN	AF	AB	AN	AF
Surface Sentence Type	Questions (Total)	26.50 (10.38)	42.00** (14.33)	40.57 (9.43)	33.20 (5.40)	46.00* (11.05)	68.00** (9.60)	20.50 (9.67)	49.14*** (11.33)	62.14*** (8.51)	26.33 (9.81)	45.68*** (12.18)	55.74*** (14.75)
	Wh-questions	9.00 (4.76)	9.71 (8.75)	11.43 (6.19)	17.60 (9.10)	17.60 (5.18)	29.20* (12.93)	4.33 (4.84)	11.14* (4.14)	15.00** (4.08)	9.87 (8.48)	12.32 (6.94)	17.42** (10.50)
	Wh-final	1.00 (1.15)	1.14 (2.27)	0.57 (0.98)	0.00	0.40 (0.89)	0.00	0.00	0.14 (0.38)	0.43* (0.53)	0.27 (0.70)	0.57 (1.46)	0.37 (0.68)
	Aux. yes/no	8.00 (5.16)	11.71 (2.93)	10.57 (3.60)	8.80 (3.90)	13.60* (3.85)	20.40* (6.07)	6.67 (6.31)	15.14* (6.52)	20.86** (7.43)	7.73 (5.02)	13.47** (4.75)	16.95*** (7.48)
	Raised verb	1.50 (3.00)	0.86 (1.07)	1.71 (2.43)	0.40 (0.89)	0.40 (0.89)	0.00	0.17 (0.41)	0.00	0.00	0.60 (1.59)	0.42 (0.84)	0.63 (1.64)
	Raised Intonation	2.00 (1.63)	7.71* (2.13)	8.29* (2.69)	0.40 (0.89)	2.40* (1.67)	2.40 (3.29)	1.67 (1.51)	6.86** (2.34)	7.43*** (2.44)	1.33 (1.45)	6.00*** (3.00)	6.42*** (3.61)
	Declarative + Tag	2.00 (1.63)	1.14 (1.07)	1.14 (2.27)	6.00 (4.00)	4.00 (2.45)	2.80* (1.79)	7.33 (2.16)	5.29 (2.36)	4.86 (3.80)	5.47 (3.44)	3.42* (2.65)	2.95* (3.15)
	Tag	0.00	1.14* (1.07)	1.43 (2.23)	0.00	3.20* (2.28)	6.00 (6.78)	0.00	5.14** (3.80)	3.14* (3.18)	0.00	3.15*** (3.08)	3.26*** (4.32)
	Fragment Questions	3.00 (1.16)	8.57** (2.99)	5.43 (2.99)	0.00	4.40* (3.58)	7.20** (4.45)	0.33 (0.82)	5.43* (4.04)	10.43** (6.73)	0.93 (1.49)	6.32*** (3.82)	7.74*** (5.18)

Legend: AB = Adult Speech Type I to Children
AN = Adult Speech Type II to Native
AF = Adult Speech Type II to Foreigner

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

range of AN and AF. In individual results, there is significantly more deixis in AB than in either AN or AF in age-pair 5 or AN in age-pair 3. Although deixis in AB (6.00) is half the mean of either AN or AF in age-pair 2, it is still not close to the mean of AF (13.14) nor to that of AN (12.86); again AB parameters are beyond those of AN or AF. Only fragment declaratives are near enough the overall mean of AF. AB is, therefore, somewhat closer to A/A than A/C in its significantly greater number of canonical structures. As expressive / informative discourse primarily communicates information, the function of AB appropriately determines the prevalence of declaratives.

However unexpected these findings are, they are not in disagreement with existing reports in the literature. In Chapter Two (II.2.c.ii) we mentioned that the fluctuation of surface sentence types across studies and within studies suggests the presence of some factor at play. Indeed, Rondal's study -- not his interpretation -- shows highly significant interaction for declaratives according to situations -- free play and storytelling ($p<.001$). Interpreted in the light of this study, the prevalence of declaratives would not seem to be due to the linguistic stage of the addressee nor to his age (as suggested by Newport et al.). Rather, it would appear to be in response to a change in the function of speech.

ii - Imperative (Total)

The grand mean of AB is not significantly different from that of

AN or AF although it maintains its predicted direction. AB contains more imperatives (total) than either AN or AF and the sub-variable of positive imperatives is significantly higher in AB than AN or AF. However, imperatives with subject are significantly more in AN and AF than in AB (Table 5.2). It seems, then, that adults in dominating / directing the conversation use subjectless imperatives more frequently than they do in eliciting conversation. On the other hand, in eliciting conversation, adults tend to use more polite forms of requests on their interlocutors and more individualized subject (vocative) and imperative commands than in communicating information. That is, Type I or AB, is more frequently associated with direct and generalized imperatives, whereas Type II or AN or AF is associated with more individualized forms of command which nominate the interlocutor. Although this almost polarized distribution of significance between the sub-variables removes significance on the total variable, it nevertheless reflects the fact that different speech functions are associated with a fine grid of syntactic features.

Here again, results from Rondal's table corroborate those reported in this section. While Rondal does not classify imperative into sub-variables as does the present study, his ANOVA shows no significant effect for this category according to situations. Nevertheless, the mean suggests an increase in imperative according to free play or storytelling (1.90) rather than according to the sex of the parent (0.36).

iii - Questions (Total)

The grand mean of AB and four of its sub-components contain significantly fewer non-deformed structures than the means of either AN or AF. This is the type of significant difference we had hoped to obtain due to a change in the linguistic abilities of the addressees. This is also the kind of significant difference most frequently reported between motherese and adultese. Alternatively, what we find is a significant shift in surface sentence distribution to the same addressee according to the function of speech directed to him. Such results do not support either the fine-tuning or the multi-factor hypotheses since both assume that the nature of the addressee (stage or age) controls the syntactic properties of motherese.

As seen in Table 5.2, the direction of difference between either AB versus AN or AB versus AF, as well as the level of its significance, establishes AB as a significantly different type of speech from either AN or AF. AN and AF have significantly more questions (total) and more auxiliary inverted yes/no questions, raised intonation and tag and fragment questions than AB. AB seems somewhat similar to A/A which is widely reported to contain significantly fewer questions than A/C (Newport, 1976, among others). So while expressive / informative discourse reliably uses statements, responsive / interactive speech is reliably associated with questions. The only type of question which is consistently greater in number in AB than in either AN or AF is the declarative + tag type. Unlike other sub-classifications of questions, declarative + tag questions are more of a rhetorical type of question which do not have the prospective function of eliciting

interaction between speaker and hearer. They are not necessarily marked for the addressee; they involve minimal or no response on his part and are probably used as an attention-holding device rather than as a turn-giving one. This argument gains force due to the repeated observation of an almost polarized distribution between declaratives + tag in AB and all other types of questions in both AN and AF for all the age-pairs. It is therefore the case that certain types of questions are associated with certain discourse functions. Declarative + tags are associated with informative/expressive speech whereas almost all other forms of questions are associated with responsive/interactive speech, demonstrating in both cases the purpose to which the speaker employs his language.

Whereas this argument as well as the above results may seem surprizing, the discussion in Chapter Two (II.2.C.ii) implied the presence of a potential factor in motherese results on this parameter. In fact, Rondal's findings strengthen those found in this study. Although Rondal did not use extensive sub-classifications as in this thesis, his data, nevertheless, demonstrates a highly significant interaction for questions according to his situation: free play (which is comparable to responsive/interactive speech or AN or AF), and storytelling (which is comparable to the informative/expressive function, or AB). The results for all surface sentence distribution argue that the type of speech, rather than the type of listener, is responsible for motherese-like effects.

III. 3. Complexity Measures

The fine-tuning theory has always maintained that the low level of complexity in A/C is indicative of its simplicity and its potential teaching value. Research has demonstrated that in comparison with A/A, adults speaking to children reduce the number of embedded sentences, limit preverbal length, use subject-verb structures and restrict their reference to present events. These features were assumed to be listener-dependent ones. However, comparisons between AN and AF (Chapter Four) do not exhibit any significant differences in the complexity of input according to the nature of the addressee and, in turn, do not substantiate the fine-tuned theory. On the other hand, the comparisons carried out in this chapter between the two types of speech addressed to the same listener strongly corroborate the functional hypothesis. Motherese-like effects are created when the addressee is held constant and the type of speech is changed. There are highly significant differences according to the speaker's conversational purposes on almost all the complexity measures used in this study.

In comparison with AN, AB contains significantly more present tense, multipropositions and S-nodes per sentence (see Table 5.3). AB includes a greater number of future reference but significantly fewer past tense ones and significantly fewer verbless utterances than AN. The same pattern of differences, their direction and significance levels, is duplicated for AB versus AF on all the six parameters of complexity (Table 5.3). These are the sort of differences the fine-tuning theory leads us to expect between AN and AF but which did not occur.

Table 5.3 - Means, (Standard Deviation) and significance levels for overall and individual results of complexity measures in comparisons between AB versus AN or AF

Group & Single Analysis	Speech Category	Adult Speech Parameters					
		Present	Past	Future	Verbless Utt.	Multipro-position	S-node/ Sentence
Overall	AB	79.00 (8.22)	6.20 (5.43)	7.07 (6.62)	7.73 (4.25)	27.80 (11.20)	1.30 (0.31)
	AB/ AN	67.00** (13.46)	6.63** (7.57)	5.84 (5.23)	20.53*** (7.63)	9.32*** (4.68)	1.12*** (0.06)
	AB/ AF	64.42** (15.67)	10.37* (12.86)	5.26* (5.48)	19.95*** (9.38)	9.79** (3.85)	1.13*** (0.05)
Pair 2: 26-32 months	AB	70.00 (3.65)	5.50 (5.51)	3.00 (8.72)	11.50 (1.00)	19.50 (11.00)	1.22 (0.12)
	AB/ AN	65.71 (4.96)	6.86 (5.52)	10.86 (2.54)	16.57* (4.58)	8.00* (6.43)	1.10* (0.08)
	AB/ AF	71.43 (10.31)	5.14 (5.54)	10.00 (4.00)	13.43 (6.29)	8.29* (4.54)	1.10* (0.05)
Pair 3: 35-39 months	AB	82.40 (3.85)	3.60 (4.10)	7.60 (4.56)	6.40 (3.85)	22.00 (8.25)	1.24 (0.09)
	AB/ AN	77.60* (5.90)	2.00 (2.00)	3.20* (1.79)	17.20** (3.90)	11.20 (4.38)	1.14** (0.05)
	AB/ AF	69.60* (10.53)	6.40 (13.22)	4.40 (5.55)	19.60* (4.77)	10.80 (4.82)	1.14** (0.06)
Pair 5: 66-72 months	AB	82.17 (9.02)	8.83 (5.95)	2.67 (2.94)	6.33 (4.76)	38.17 (6.33)	1.41 (0.08)
	AB/ AN	60.71* (18.81)	9.71 (10.48)	2.71* (5.19)	26.86** (8.34)	9.29*** (2.56)	1.13*** (0.03)
	AB/ AF	53.71** (18.53)	18.42* (14.97)	1.14 (2.61)	26.71*** (10.16)	10.57*** (2.07)	1.15** (0.03)

Legend: AB = Adult Speech Type I to Children
AN = Adult Speech Type II to Native
AF = Adult Speech Type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

The findings are impressive. As predicted, the means of AB fall significantly outside those of either AN or AF. The comparison creates the kind of differences reported in the literature for the motherese phenomenon. Indeed, A/B is similar to A/A in its long sentences of more than one proposition, its infrequent subject-verb violation and its less varied tense reference. A/B is distinctly outside the range of AN and AF. The speaker in responsive/interactive discourse is mainly interested in eliciting conversation from the addressee and is, therefore, responsive to whichever topic or reference is nominated by his interlocutor. This behaviour brings about short utterances with low propositional complexity and a prevalence of verbless utterances (stock expressions) which arise from interactive purposes. In informative/expressive speech, the speaker exerts a greater control over his listeners, selects the topics and nominates the reference. In so doing, multipropositional informative statements are used and tense is restricted to whichever event the speaker has opted to inform his listener about. As the speaker largely dominates the conversation, instances of interactive comments, such as verbless utterances and stock expressions (interjections), are reduced.

As we have mentioned earlier (III.1.2.3), results in the literature support the functional hypothesis. In Chapter Two (II.2.b) we pointed out that sentence complexity measures significantly changed from the easy to the difficult task in Snow's data (1972). Fraser and Roberts (1973) also report significant effects ($p<.001$) between the grammatical complexity of speech in free play and storytelling. These two conditions represent type II

and type I distinctions in this study. Furthermore, Rondal (1980) also reports significant interactions according to the context of speech free play versus storytelling. (Also, Engle's data (1978) reviewed in Chapter Two (III.C.1) demonstrates significant effects.) Guided by such reports in the literature as well as those obtained in our results, we can safely conclude that the function of discourse, rather than the listener's sophistication, shapes the complexity level of the input. Furthermore, changes in function create motherese-like effects to the same addressee.

III. 4. Discourse Measures

Imitation and corrections have always been considered in the field to be the discourse features which most distinguish speech to children from speech to adults. The significant differences obtained for these measures between AB versus AN, and AB versus AF are characteristic of the motherese properties (see Table 5.4). Our samples of speech to children contain -- significantly enough -- no imitations or no corrections. Such results argue that the function of discourse shapes its rhetorical features. Indeed, AB on these parameters is close to A/A.

The almost polarized distribution of discourse features between the two types of speech runs counter to some current views. If, as the fine-tuning theory argues, discourse features arise from the learner's linguistic or psycholinguistic needs and are incidental 'tutorial devices', then we would expect such features to remain constant across situations to the same listener. If, on the other

Table 5.4: Means, (Standard Deviation) and significance levels for individual and overall results of discourse measures in comparisons between AB versus either AN or AF.

	Adult Speech Parameters	Pair 2: 26-32 months			Pair 3: 35-39 months			Pair 5: 66-72 months			Overall		
		AB	AN	AF	AB	AN	AF	AB	AN	AF	AB	AN	AF
Discourse Measures	Imitation (Total)	0.00	11.14* (4.14)	5.43* (3.95)	0.00	4.40* (4.34)	7.20* (3.63)	0.00	13.43*** (4.20)	9.00*** (3.16)	0.00	10.21* (5.43)	7.21** (3.74)
	Imitation	0.00	3.43* (2.99)	1.43 (1.51)	0.00	2.80* (1.79)	4.40* (1.67)	0.00	10.86** (4.14)	7.71** (3.09)	0.00	6.00 (4.90)	4.53 (3.49)
	Transformed Imitation	0.00	7.71** (3.35)	4.00 (3.65)	0.00	1.60 (2.61)	2.80* (2.68)	0.00	2.57* (2.82)	1.29** (0.76)	0.00	4.21 (3.95)	2.68* (2.77)
	Correction (Total)	0.00	4.29* (2.43)	6.57** (5.13)	0.00	5.20 (5.93)	6.80** (3.35)	0.00	3.29** (1.98)	7.43** (3.55)	0.00	4.16*** (3.42)	6.95*** (3.95)
	Syntactic	0.00	1.43 (2.50)	2.00 (2.00)	0.00	0.00	1.20 (1.79)	0.00	0.00	0.29 (0.76)	0.00	0.53 (1.61)	1.16 (1.68)
	Semantic	0.00	2.00 (2.31)	3.14* (2.27)	0.00	4.00 (4.90)	4.80* (2.28)	0.00	1.00 (1.15)	1.43** (0.79)	0.00	2.16* (3.00)	2.95* (2.22)
	Rephrase	0.00	0.86 (1.57)	1.43 (2.55)	0.00	1.20 (1.74)	0.80 (1.79)	0.00	2.29* (1.80)	5.71** (3.20)	0.00	1.47* (1.74)	2.84 (3.30)
	Repetition (Total)	37.00 (11.49)	18.86 (5.40)	35.43 (7.18)	27.20 (7.56)	17.20* (3.55)	26.80 (7.16)	33.33 (4.18)	14.29*** (7.59)	27.00** (15.11)	32.27 (8.18)	16.74 (5.96)	30.47* (11.37)
	Repetition	12.50 (9.29)	7.43 (3.60)	14.29 (6.87)	9.20 (1.79)	3.20** (1.79)	8.00 (3.75)	8.33 (1.97)	3.29** (2.36)	3.29*** (4.42)	9.73 (4.89)	4.79 (3.34)	8.58 (7.00)
	Transformed Repetition	5.00 (2.00)	5.14 (3.80)	9.71 (5.82)	2.00 (2.45)	8.40* (5.37)	9.60** (3.58)	10.50 (3.27)	5.71* (4.61)	13.43 (8.06)	6.20 (4.59)	6.21* (4.49)	11.05* (6.26)
	Paraphrase	19.50 (11.36)	6.29 (1.80)	11.43 (3.60)	16.00 (7.62)	5.60* (0.89)	9.20 (2.28)	14.50 (3.78)	5.29** (4.64)	10.29* (4.57)	15.94 (7.25)	5.74 (2.94)	10.42 (3.64)

Legend: AB = Adult Speech Type I to Children
AN = Adult Speech Type II to Native
AF = Adult Speech Type II to Foreigner

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)

hand, discourse features arise from the adult's communicative and controlling needs as the multi-factor theory argues, then we would also expect such adults' needs to remain constant to the same listener. Our results show that adults dramatically change the rhetorical aspect of their speech according to their conversational purpose.

It is reasonable to assume that in informative/expressive speech the speaker is eager to have his listener understand his expression; hence the speaker repeats himself, develops his message and elaborates it, all in an effort to hold the attention of his listener. In responsive/interactive speech, the speaker is engaged in negotiating and releasing turns to his listeners. The speaker responds to the contribution of his interlocutor by acknowledging or imitating it. He may also respond to the contribution by correcting or rewording it. Consequently, the two purposes of the speaker govern his attitude to his listener and, in turn, the distribution of discourse features. Indeed, Table 5.4 supports this analysis. AB, or informative/expressive speech, has more repetitions than either AN or AF, whereas AN and AF, or responsive/interactive speech, has significantly more opportunities for imitation and corrections.

Further support to the functional theory comes from diverse but ignored reports which the review chapter attempts to highlight. In Chapter Two (II.3 and IV.3) it was argued that variations on several discourse features (including type/token ratio) in first and second language input seem to be dependent upon the nature of the

interaction rather than the nature of the addressee. Rondal's data -- not his interpretation -- once again, provide statistical evidence; although his scheme does not use the same classification followed in this study, it is, nevertheless, applicable. The proportion of direct verbal approval of children's utterances demonstrates a significant interaction in free play and storytelling tasks. In a similar manner, the proportion of expansions of children's utterances shows significant interaction for the speech situation (free play and storytelling).

In summary, then, most of the structural and rhetorical features previously identified as characteristics of motherese occur only when speech type is varied and the addressee is held constant. AB, which is comparable to A/A, represents informative/expressive speech associated with storytelling, information-passing, etc. AN or AF, which is A/C, represents responsive/interactive speech. AB is reliably different from AN and AF (which are generally alike) in ways which are reminiscent of differences between A/A and A/C. Reports hitherto ignored in the literature corroborate the functional theory and demonstrate that the factor we have been trying to identify in this dissertation is indeed the type of conversational purpose to which the speaker employs his language. The direction and level of significance of the data supporting this new hypothesis were duplicated for the native as well as for the foreign addressee.

None the less, the case for a linguistically-elicited motherese would somehow still remain strong -- however awkward that might be

-- if the division by formal and rhetorical features were found only in adult speech to children. This is the issue which the following section attempts to investigate by exploring adult speech to adults. Positive results will furnish further evidence for the functional hypothesis.

IV. Adults Speech to Adults

This section further tests the validity of the functional hypothesis in adults' speech. If, as the hypothesis predicts, the formal and rhetorical features of language change dramatically in accordance with the function of the speaker's discourse, then adult-to-adult speech or A/A should exhibit significant differences on formal and rhetorical parameters between the two functions. As reported in the previous section (III) the significant differences between the two types of speech created motherese-like effects when the child addressee was held constant and types were changed; thus one type of speech to the child (AB) was close to the properties of A/A. In a similar manner, then, it is hypothesized that comparisons across speech types to the same adult addressee would create motherese-like effects so that A/A should sometimes resemble the characteristics of adult-to-child speech or A/C.

The methodology used in this test is described below. Surreptitious recordings of adult speech were obtained in two situations: while the teacher was talking to the investigator about her job (50 utterances); and while the teacher was chatting in the Common Room with other teachers (50 utterances). (Recordings were

not made longitudinally as no developmental pattern is expected to occur in adult speech.) Using the same procedure as that reported in section II of this chapter, samples of speech from both situations were classified into two types by native judges, confirming the investigator's prior identification. One type showed itself to be informative/expressive speech and was labelled AI; the other, labelled AII, fell into the category of responsive/interactive speech. A correlated t-test was carried out on AI and AII of the three teachers on each of the syntactic and rhetorical parameters originally used for the analysis of adult-to-child speech data.

Furthermore, predictions were made as to whether the difference on each parameter between AI and AII was towards or away from motherese-like features. These predictions were compiled from the published reports of Bard (1980), Cross (1977) and Furrow et al. (1979) and appear on table 5.5. However, not all researchers use the same classification of variables as that used in this study; thus it will be noticed that predictions have not been made on all the parameters used in the study. For example, it was not possible to make predictions for the sub-categories in declaratives and imperatives. Likewise, while it was possible to make predictions for the sub-classification of questions as in wh- and auxiliary yes/no questions, an overall prediction taken from Furrow et al. had to be made for the other sub-categories of yes/no questions (wh-final, raised verb, raised intonation, declarative + tag, tag and fragment questions). Furthermore, the category of verbless utterances in this study included the total of fragments and interjections for which the literature had predictions. Thus, a

Table 5.5 - Means, (Standard Deviation) and significance level of Adult/Adult speech of teachers in Type II (A II) versus Type I (A I) comparisons.

Adult Speech Parameters		Teacher ONE		Teacher TWO		Teacher THREE		Means (S.D.)		Prediction	
		A II	A I	A II	A I	A II	A I	A II	A I	AC/AA	Obtained
Overall	MLU	6.02	13.48	4.46	8.64	5.54	11.40	5.34 (0.80)	11.17* (2.43)	<	✓
	MUT	2.38	5.56	2.00	3.57	2.50	5.56	2.29 (0.26)	4.90* (1.15)	<	✓
	Sentence	72	96	66	80	86	92	74.67 (10.26)	89.33† (8.33)		
	Fragment	14	4	18	8	10	4	14.00 (4.00)	5.33* (2.31)	>	✓
	Interjection	14	0.00	16	12	4	4	11.33 (6.43)	5.33 (6.11)	>	✓
Surface Structure Type	Declarative (Total)	64	98	32	80	62	94	52.67 (17.93)	90.67** (9.45)	<	✓
	Declarative	50	90	28	76	36	88	38.00 (11.14)	84.67** (7.57)		
	Deictic	6	4	0.00	0.00	18	2	8.00 (9.17)	2.00 (2.00)		
	Fragment Declarative	8	4	4	4	8	4	6.67 (2.31)	4.00 (0.00)		
	Imperative (Total)	4	0.00	10	2	4	0.00	6.00 (3.46)	0.67* (1.15)	>	✓
	+ Imperative	4	0.00	8	2	4	0.00	5.33 (2.31)	0.67** (1.15)		
	- Imperative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Imperative + Subject	0.00	0.00	2	0.00	0.00	0.00	0.67 (1.15)	0.00		
	Fragment Imperative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

Legend: † $p \leq .08$ * $p \leq .05$ **$p \leq .01$ *** $p \leq .001$ (1 tailed) > greater than < smaller than

Table 5.5 - (cont'd) Means, (Standard Deviation) and significance level of Adult/Adult speech of teachers in Type II (A II) versus Type I (A I) comparisons.

Adult Speech Parameters		Teacher ONE		Teacher TWO		Teacher THREE		Means (S.D.)		Prediction	
		A II	A I	A II	A I	A II	A I	A II	A I	AC/AA	Obtained
Surface Structure Type	Questions (Total)	18	2	42	6	30	2	30.00 (12.00)	3.33* (2.31)	>	✓
	Wh-question	4	2	6	2	8	0.00	6.00 (2.00)	1.33† (1.15)	>	✓
	Wh-final	0.00	0.00	0.00	0.00	2	0.00	0.67 (1.15)	0.00		
	Aux. yes/no	4	0.00	14	0.00	16	0.00	11.33 (6.43)	0.00*	>	
	Raised Verb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Raised Intonation	0.00	0.00	2	0.00	2	2	1.33 (1.15)	0.67 (1.15)		
	Declarative + Tag	4	0.00	6	0.00	0.00	0.00	3.33 (3.06)	0.00	>	✓
	Tag	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Fragment Question	6	0.00	14	4	2	0.00	7.33 (6.11)	1.33 † (2.31)		
Complexity	Present	68	70	60	70	70	68	66.00 (5.29)	69.33 (1.15)		
	Past	2	10	0.00	10	2	24	1.33 (1.15)	14.67* (8.08)	<	✓
	Future	2	16	6	0.00	14	0.00	7.33 (6.11)	5.33 (9.24)	>	✓
	Verbless Utterance	28	4	34	20	14	8	25.33 (10.26)	10.67† (8.33)	>	✓
	Multiproposition	20	62	6	44	12	48	12.67 (7.02)	51.33** (9.45)	<	✓
	S-node/ Sentence	1.31	1.92	1.09	1.78	1.29	1.74	1.23 (0.12)	1.81** (0.09)	<	✓

Legend: † $p \leq .08$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed) > greater than < smaller than

Table 5.5 - (cont'd) Means, (Standard Deviation) and significance level of Adult/Adult speech of teachers in Type II (A II) versus Type I (A I) comparisons.

	Adult Speech Parameters	Teacher ONE		Teacher TWO		Teacher THREE		Means (S.D.)		Prediction	
		A II	A I	A II	A I	A II	A I	A II	A I	AC/AA	Obtained
Discourse Features	Imitation (Total)	4	0.00	2	0.00	8	0.00	4.67 (3.06)	0.00†	>	✓
	Imitation	4	0.00	2	0.00	4	0.00	3.33 (1.15)	0.00**		
	Transformed Imitation	0.00	0.00	0.00	0.00	4	0.00	1.33 (2.31)	0.00		
	Correction (Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Syntactic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Semantic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Rephrase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Repetition (Total)	10	24	6	18	10	24	8.67 (2.31)	22.00** (3.46)	>	✗
	Repetition	4	10	6	6	8	12	6.00 (2.00)	9.33 (3.06)		
	Transformed Repetition	4	4	0.00	4	2	0.00	2.00 (2.00)	2.67 (2.31)		
	Paraphrase	2	10	0.00	8	0.00	12	0.67 (1.15)	10.00** (2.00)	>	✗

Legend: † $p \leq .08$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed) > greater than < smaller than

prediction for verbless utterances was added to complexity measures. Consequently, while there are 29 overall syntactic and complexity parameters, there are predictions on only 15 of them. There are also 3 predictions gleaned for the 11 discourse measures. All in all then, there are 18 predictions concerning direction which characterize motherse as different from adultese.

Table 5.5 shows that there are significant differences between AI and AII on 19 out of 40 parameters. These results corroborate the functional hypothesis and establish AI as clearly distinct from AII.

The second set of expectations are also fully satisfied. Out of 15 predictions on the overall syntactic and complexity level, all 15 meet the direction of difference previously reported in the literature to characterize adult-to-child speech.

This, then, shows that AII is very similar -- in syntactic features -- to A/C, which in this present study would mean AN and AF. The reverse of this result is also true. Since these 15 predictions are in a direction away from A/A, we may conclude that AI is similar -- in syntactic features -- to what is referred to in the literature as A/A. Within the framework of this thesis, then, AI is seen to closely resemble AB.

Three predicted directions of difference were made on the discourse level of description. Only one, imitation (total), is met. Although the other two parameters, repetition and paraphrase,

show significant differences, in both cases the difference is in the wrong direction: AI shows more repetition and paraphrase than AII.

Interestingly enough, the fine-tuning theory predicts differences which are not fulfilled on a syntactic level. The functional hypothesis finds the opposite: on a syntactic level all predictions are met, whereas only one out of three predictions on a discourse level is met.

In summary, then, this section establishes the following points. First, there are two significantly different types of adult-to-adult speech, one informative-expressive speech (AI) and the other responsive-interactive speech (AII).

Secondly, AII seems to resemble adult-to-child speech. It has significantly lower mlu, shorter mut, more interjections and fragments, more questions, more imperatives and fewer declaratives. On the complexity level, it shows a low complexity index and reference is restricted to the present tense. These characteristics define it as interactive speech and, at the same time, agree with the A/C description of simplicity. Moreover, AII speech also exhibits the same complexity as A/C speech in its wide-ranging surface distribution and its predominance of non-canonical structures. The existence of AII, then, demonstrates that motherese-like features can also occur in adult-to-adult speech between speakers of the same status and the same linguistic and cognitive abilities. This, in effect, calls into question both the multi-factor hypothesis and the fine-tuning hypothesis. The former

posits that a change in addressee produces motherese, whereas the latter states that it is the linguistic ability of the child which will govern the type of language directed at him. Neither is supported by the findings in this section.

Lastly, contrary to the expectations shown in previous research, we have found that adult-to-adult speech can exhibit similar discourse features to those found in adult-to-child speech. Adults imitate each other and paraphrase and repeat in the presence of each other. The only parameter on which A/A differs from A/C appears to be that of correction. Adults, seemingly, do not correct each other.

The findings of this section therefore confirm the predictions made by the functional hypothesis.

V. How Does The Artefact Arise?

The aim of this section is to show how the findings of this dissertation relate to and explain certain reports in the literature. Research in the field has tabulated significant differences between A/A and A/C , i.e. motherese effects and have interpreted them to arise from the age or the linguistic stage of the addressee. A/A is the adult baseline against which A/C values have been tested to characterize motherese in the literature. In the previous section (IV) we have shown that AI and A/A are very similar in syntactic profile and in some discourse features; we have also shown that AII and A/C are very similar in syntactic and

discourse distribution. The differences between AII and AI were significant and replicated the differences between A/C and A/A and their direction.

This section argues that some of the motherese effects in the literature have occurred as a result of comparisons made between different speech types rather than between the same speech type. In other words, rather than comparing adult-to-adult type I speech (AI) with adult-to-child type I speech (AB) or conversely, adult-to-adult type II speech (AII) with adult-to-child type II speech (AN or AF) the comparisons made have been between AI and AN or AF.

In previous research, experimenters have always obtained a baseline of adult-to-adult speech by having the adult caretaker explain or talk about the particulars of the child's behaviour, or the mothers' rearing routines. That is, the adult caretaker was engaging in informative/expressive speech referred to here as AI rather than responsive/interactive speech labelled AII. By the same token, previous researchers have most frequently obtained samples of adult-to-child speech by asking the adult caretaker to do something with the child and have him talk. Consequently, the adult caretaker engaged the child in some activity to stimulate conversation, thereby generating a responsive/interactive type of speech which is identified in this study as AN and AF.

In order to support the proposition that certain motherese effects have been created by comparisons between different speech type baselines, the following analysis has been made using

correlated t-tests:

1. Across type comparisons: AI versus either AN or AF.

It is predicted that varying the type of speech will duplicate most of the differences previously reported in motherese research.

2. Within type comparison: AI versus AB.

It is predicted that holding the type of speech constant will produce much more modest addressee effects than those obtained in 1 above.

3. Within type comparisons: AII versus either AN or AF.

It is predicted that holding the type of speech constant will also yield much more modest addressee effects than in 1 above.

V. 1. Across Type Comparisons: AI versus either AN or AF.

The results reported in Table 5.6 for comparisons between AI versus AN and AI versus AF support the prediction; comparisons between different types of speech reproduce the same significant direction of differences mentioned in the literature between A/A and A/C. Moreover, there are comparable significant results for the two linguistically different listeners. There are 15 significant differences between AI versus AN on the syntactic level of description, 3 of which (declarative + tag, tag and past tense)

approach significance at the .08 level (2 degrees of freedom). There are another 5 significant differences on the discourse level, 2 of which approach significance (semantic correction and transformed repetition). Furthermore, Table 5.6 shows that AI versus AF reproduces almost all the significant differences which have been obtained for AI versus AN. On the syntactic level of description, there are 15 significant differences between AI and AF only 2 (declarative + tag and tag) approach significance at .08. There are 6 significant differences for discourse parameters.

These significant differences between AI and either AN or AF are typical of A/A and A/C differences and indeed support the reports in the literature. The motherese column compiled from previous studies shows 18 predictions for the direction of difference between A/A and A/C (Table 5.6). The prediction column shows that even when significance is not reached the direction of the difference between AI and either AN or AF is fulfilled. This finding both validates the test carried out in this data as well as previous observations. In fact, had we not created motherese effects to the same child addressee by comparing two different types of speech directed at him (see Section III), and had we not created motherese effects to the adult by similar comparisons of type I versus type II speech (see section IV), the present results would have led us to the same conclusion as that of previous researchers: the syntactic, and to some extent, the rhetorical profile of input is listener dependent. However, the present results demonstrate that such a conclusion is the product of a comparison between dissimilar speech functions.

Table 5.6 - Means, (Standard Deviation) and significance levels for overall AI (teachers' speech to adults in Type I) versus AN and AF (teachers' speech to Natives and Foreigners in Type II).

	Adult Speech Parameters	Overall			Prediction	
		AI	AN	AF	A/A AC	Obtained
Overall	MLU	11.17 (2.43)	5.49* (0.54)	5.56* (0.69)	>	✓
	MUT	4.90 (1.15)	2.27* (0.50)	1.75* (0.25)	>	✓
	Sentence	89.33 (8.33)	79.47 (7.63)	80.05 (9.33)		
	Fragment	5.33 (2.31)	12.37 (5.65)	12.26 (6.55)	<	✓
	Interjection	5.33 (6.11)	8.16 (4.36)	7.68 (3.99)	<	✓
Surface Structure Type	Declarative (Total)	90.67 (9.45)	35.42** (11.56)	27.74*** (9.03)	<	✓
	Declarative	84.67 (7.57)	20.32** (8.81)	15.74*** (7.31)		
	Deictic	2.00 (2.00)	9.79* (7.91)	8.11* (6.36)		
	Fragment Declarative	4.00 (0.00)	5.32 (5.11)	3.89 (3.23)		
	Imperative (Total)	0.67 (1.15)	10.74 (9.62)	8.84 (8.95)	<	✓
	+ Imperative	0.67 (1.15)	6.68 (6.39)	6.11 (6.00)		
	- Imperative	0.00	0.32 (0.75)	0.32 (1.00)		
	Imperative + Subject	0.00	3.00* (3.33)	1.89 (2.64)		
	Fragment Imperative	0.00	0.74 (1.19)	0.53 (1.61)		

Legend: † $p \lesssim .08$ * $p \lesssim .05$ ** $p \lesssim .01$ *** $p \lesssim .001$ (1-tailed)
> greater than < smaller than

Table 5.6 - (cont'd) Means, (Standard Deviation) and significance levels for overall AI (teachers' speech to adults in Type I) versus AN and AF (teachers' speech to Natives and Foreigners in Type II).

	Adult Speech Parameters	Overall			Prediction	
		AI	AN	AF	A/A_{AC}	Obtained
Surface Structure Type	Questions (Total)	3.33 (2.31)	45.68** (12.18)	55.74** (14.75)	<	✓
	Wh-questions	1.33 (1.15)	12.32* (6.94)	17.42* (10.50)	<	✓
	Wh-final	0.00	0.57 (1.46)	0.37 (0.68)		
	Aux. yes/no	0.00	13.47** (4.75)	16.95* (7.48)	<	✓
	Raised Verb	0.00	0.42 (0.84)	0.63 (1.64		
	Raised Intonation	0.67 (1.15)	6.00* (3.00)	6.42* (3.61)		
	Declarative + tag	0.00	3.42† (2.65)	2.95† (3.15)	<	✓
	Tag	0.00	3.15† (3.08)	3.26† (4.32)		
	Fragment Question	1.33 (2.31)	6.32 (3.82)	7.74* (5.18)		
Complexity	Present	69.33 (1.15)	67.00 (13.46)	64.42 (15.67)		
	Past	14.67 (8.08)	6.63† (7.57)	10.37** (12.86)	>	✓
	Future	5.33 (9.24)	5.84 (5.23)	5.26 (5.48)	<	✓
	Verbless Utterance	10.67 (8.33)	20.53 (7.63)	19.95 (9.33)	<	✓
	Multiproposition	51.33 (9.45)	9.32* (4.68)	9.79* (3.85)	>	✓
	S-node/sentence	1.81 (0.09)	1.12** (0.06)	1.13** (0.05)	>	✓

Legend: † $p \leq .08$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)
> greater than < smaller than

Table 5.6 - (cont'd) Means, (Standard Deviation) and significance levels for overall AI (teachers' speech to adults in Type I) versus AN and AF (teachers' speech to Natives and Foreigners in Type II).

	Adult Speech Parameters	Overall			Prediction	
		AI	AN	AF	A/A AC	Obtained
Discourse Measures	Imitation (Total)	0.00	10.21* (5.43)	7.21** (3.74)	<	✓
	Imitation	0.00	6.00 (4.90)	4.53 (3.49)		
	Transformed Imitation	0.00	4.21 (3.95)	2.68* (2.77)		
	Correction (Total)	0.00	4.16** (3.42)	6.95** (3.95)		
	Syntactic	0.00	0.53 (1.61)	1.16 (1.68)		
	Semantic	0.00	2.16† (3.00)	2.95* (2.22)		
	Rephrase	0.00	1.47* (1.74)	2.84 (3.30)		
	Repetition (Total	22.00 (3.46)	16.74 (5.96)	30.47* (11.37)	<	✓
	Repetition	9.33 (3.06)	4.79 (3.34)	8.58 (7.00)		
	Transformed Repetition	2.67 (2.31)	6.21† (4.49)	11.05* (6.26)		
	Paraphrase	10.00 (2.00)	5.74 (2.94)	10.42 (3.64)	<	✓

Legend: † $p \leq .08$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (1-tailed)
> greater than < smaller than

In short, then, the prediction that across-type comparisons will reproduce most of the differences previously documented for A/A versus A/C is met at a statistically significant level for AI versus either AN or AF.

V. 2. Within Type Comparison: AI versus AB.

It is predicted that a comparison carried out between adult-to-adult and adult-to-child speech within a similar speech type will produce moderate to low significant results. In section III of this chapter, we have argued that AB is informative/expressive speech to children which comes very close in its syntactic and rhetorical characteristics to A/A. In sections IV and V.1 we have also shown that AI, or informative/expressive speech in adult language, reproduces the syntactic and rhetorical properties of A/A and indeed its significant differences. Hence, a comparison of informative/expressive speech to adult and to child should yield modest effects for the addressee.

The results reported in Table 5.7 fulfil this prediction. On the syntactic level of description, there are 9 significant results 2 of which approach significance at .08 (wh- questions and past tense verbs). Only 2 discourse results are significant. Whereas AI differs significantly from AB on 9 measures of syntax, AI differs significantly from both AN and AF on 15 syntactic parameters. In a similar manner, in AI versus either AN or AF, there are 5 and 6 significant differences respectively for the discourse level, whereas in AI versus AB, only 2 significant results are obtained.

Table 5.7 - Means, (Standard Deviation) and significance level for overall AI (teachers' speech to adults in type I) versus overall AB (teachers' speech to children in type I).

Adult Speech Parameters		Overall Means (S.D.) AI	AB
Overall	Mean Length of Utterance	11.17 (2.43)	8.33 (1.33)
	Mean Number of Utterances/Turn	4.90 (1.15)	3.27 (1.19)
	Sentence	89.33 (8.33)	92.13 (4.02)
	Fragment	5.33 (2.31)	5.20 (3.63)
	Interjection	5.33 (6.11)	2.66 (2.22)
Surface Structure Type	Declarative (Total)	90.67 (9.45)	59.73* (16.57)
	Declarative	84.67 (7.57)	44.47** (10.82)
	Deictic	2.00 (2.00)	11.80 (9.24)
	Fragment Declarative	4.00 (0.00)	3.47* (2.75)
	Imperative (Total)	0.67 (1.15)	11.20 (11.12)
	+ Imperative	0.67 (1.15)	9.87 (9.80)
	- Imperative	0.00	0.00
	Imperative + Subject	0.00	0.53 (1.19)
	Fragment Imperative	0.00	0.80 (1.26)
	Questions (Total)	3.33 (2.31)	26.33** (9.81)
	Wh-question	1.33 (1.15)	9.87† (8.48)
	Wh-final	0.00	0.27 (0.70)
	Aux. yes/no	0.00	7.73** (5.02)
	Raised Verb	0.00	0.60 (1.59)
	Raised Intonation	0.67 (1.15)	1.33 (1.45)
	Declarative + Tag	0.00	5.47* (3.44)
	Tag	0.00	0.00
	Fragment Question	1.33 (2.31)	0.93 (1.49)

Legend:
† p .08 * p .05 ** p .01 *** p .001 2df (1-tailed)

Table 5.7 - (cont'd) Means, (Standard Deviation) and significance level for overall AI (teachers' speech to adults in type I) versus overall AB (teachers' speech to children in type I).

	Adult Speech Parameters	Overall Means (S.D.) AI	AB
Complexity	Present	69.33 (1.15)	79.00 (8.22)
	Past	14.67 (8.08)	6.20 † (5.43)
	Future	5.33 (9.24)	7.07 (6.62)
	Verbless Utterance	10.67 (8.33)	7.73 (4.25)
	Multiproposition	51.33 (9.45)	27.80 (11.72)
	S/node/sentence	1.81 (0.09)	1.30* (0.13)
Discourse Measures	Imitation (Total)	0.00	0.00
	Imitation	0.00	0.00
	Transformed Imitation	0.00	0.00
	Correction (Total)	0.00	0.00
	Syntactic	0.00	0.00
	Semantic	0.00	0.00
	Rephrase	0.00	0.00
	Repetition (Total)	22.00 (3.46)	32.27** (8.18)
	Repetition	9.33 (3.06)	9.73 (4.89)
	Transformed Repetition	2.67 (2.31)	6.20 (4.59)
	Paraphrase	10.00 (2.00)	15.94* (7.25)

Legend:
† $p \leq .08$ * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ 2df (1-tailed)

In other words, the results meet the prediction and further substantiate the explanation offered above (V.1) as to the creation of motherese.

Although such observations might seem unusual, results in the literature lend support to them. In Chapter Two II.1.d., it was pointed out that had Broen (1972) computed words per minute (w/m) between A/A and the comparable A/C baseline (storytelling), her results might not have been significant. (A/A was 132 w/m while A/C in storytelling was 127.5 w/m and in free play 86.2 w/m.) Furthermore, in II.2.a. it was pointed out that some A/A mlu values were smaller than some A/C ones (Ringler's A/A was 7.05 whereas Fraser and Roberts' A/C in storytelling was 9.0). (The same observation was also noted for sentence complexity as well as for some parameters in teachers' speech to second language learners.) These observations together with the results reported in Table 5.7 argue that A/C, in some cases, may be comparable to, rather than, significantly different from A/A. In fact, it is to such comparisons which further validate the functional hypothesis that we address ourselves below.

V. 3. Within Type Comparison: AII versus AN or AF.

If type is important, it is predicted that comparisons within the same type but across addressees should yield much more modest results than when types vary (as in V.1.). We have already argued that a responsive/interactive type of speech, identified as occurring in adult-to-adult speech (AII), shares a number of

syntactic and rhetorical properties with adult-to-child speech, or the current AN and AF. Hence, comparisons within responsive/interactive speech between adult (AII) and child (either AN or AF) should produce a moderate number of significant results.

The results reported in Table 5.8 meet this prediction. Comparisons between AII and AN yield 1 significant difference on the syntactic level of description and 4 others which approach significance. On the discourse level, 5 significant results are found and 1 other approaches significance. These results are much lower than those in V.1. AI versus AN produced 12 significant differences for syntactic properties and 3 others approached significance, all in all 15. For discourse measures, 3 were significant and 2 approached significance.

A comparable pattern obtains for AII versus AF. There are 5 significant syntactic measures and another 1 which is significant at .08. This is just the opposite of AI versus AF comparisons, where there are 13 significant differences for syntactic parameters and another 2 approach significance; all in all 15. The discourse index is almost the same in both comparisons. AII differs significantly from AF on 5 measures and AI also differs significantly from AF on 5 discourse measures. The results, therefore, demonstrate that adult-to-adult speech in the responsive/interactive function can be comparable to, rather than significantly different from, AN or AF. In general, the predictions concerning this set of comparisons are met.

Table 5.8 - Means, (Standard Deviation) and significance level for overall AII (teachers' speech to adults in type II) versus overall AN and AF (teachers' speech to either Natives and Foreigners in type II).

	Adult Speech Parameters	Overall Means		
		AII	AN	AF
Overall	Mean Length of Utterance	5.34 (0.80)	5.49 (0.54)	5.56 (0.69)
	Mean Number of Utterances/Turn	2.29 (0.26)	2.27 (0.50)	1.75** (0.25)
	Sentence	74.67 (10.26)	79.47 (7.63)	80.05 (9.33)
	Fragment	14.00 (4.00)	12.37 (5.65)	12.26 (6.55)
	Interjection	11.33 (6.43)	8.16 (4.36)	7.68 (3.99)
Surface Syntactic Type	Declarative (Total)	52.67 (17.93)	35.42 (11.56)	27.74* (9.03)
	Declarative	38.00 (11.14)	20.32 (8.81)	15.74** (7.31)
	Deictic	8.00 (9.17)	9.79 (7.91)	8.11 (6.36)
	Fragment Declarative	6.67 (2.31)	5.32 (5.11)	3.89 (3.32)
	Imperative (Total	6.00 (3.46)	10.74 (9.62)	8.84 (8.95)
	+ Imperative	5.33 (2.31)	6.68 (6.39)	6.11 (6.00)
	- Imperative	0.00	0.32 (0.75)	0.32 (1.00)
	Imperative + Subject	0.67 (1.15)	3.00† (3.33)	1.89 (2.64)
	Fragment Imperative	0.00	0.74 (1.19)	0.53 (1.61)
	Questions (Total)	30.00 (12.00)	45.68† (12.18)	55.74** (14.75)
	Wh-question	6.00 (2.00)	12.32† (6.94)	17.42 (10.50)
	Wh-final	0.67 (1.15)	0.57 (1.46)	0.37 (0.68)
	Aux. yes/no	11.33 (6.43)	13.47 (4.75)	16.95** (7.48)
	Raised Verb	0.00	0.42 (0.84)	0.63 (1.64)
	Raised Intonation	1.33 (1.15)	6.00 (3.00)	6.42 (3.61)
	Declarative + Tag	3.33 (3.06)	3.42 (2.65)	2.95 (3.15)
	Tag	0.00	3.15† (3.08)	3.26† (4.32)
	Fragment Question	7.33 (6.11)	6.32 (3.82)	7.74 (5.18)

Legend: † $p \lesssim .08$ * $p \lesssim .05$ ** $p \lesssim .01$ *** $p \lesssim .001$ 2df (1-tailed)

Table 5.8 - (cont'd) Means, (Standard Deviation) and significance level for overall AII (teachers' speech to adults in type II) versus overall AN and AF (teachers' speech to either Natives and Foreigners in type II).

	Adult Speech Parameters	Overall Means		
		AII	AN	AF
Complexity	Present	66.00	67.00	64.42
		(5.29)	(13.46)	(15.67)
	Past	1.33	6.63 *	10.37
		(1.15)	(7.57)	(12.86)
	Future	7.33	5.84	5.26
		(6.11)	(5.23)	(5.48
	Verbless Utterance	25.33	20.53	20.05
		(10.26)	(7.63)	(9.48)
	Multiproposition	12.67	9.32	9.79
		(7.02)	(4.68)	(3.85)
	S/node/sentence	1.23	1.12	1.13
		(0.12)	(0.06)	(0.05)
Discourse Type	Imitation (Total)	4.67	10.21*	7.21
		(3.06)	(5.43)	(3.74)
	Imitation	3.33	6.00	4.53
		(1.15)	(4.90)	(3.49)
	Transformed Imitation	1.33	4.21	2.68
		(2.31)	(3.95)	(2.77)
	Correction (Total)	0.00	4.16**	7.05**
			(3.42)	(3.89)
	Syntactic	0.00	0.53	1.16
			(1.61)	(1.68)
	Semantic	0.00	2.16†	2.95*
			(3.00)	(2.22)
	Rephrase	0.00	1.47*	2.84
			(1.74)	(3.30)
	Repetition (Total)	8.67	16.74**	30.47**
		(2.31)	(5.96)	(11.37)
	Repetition	6.00	4.79	8.58
		(2.00)	(3.34)	(7.00)
	Transformed Repetition	2.00	6.21	11.05*
		(2.00)	(4.49)	(6.26)
	Paraphrase	0.67	5.74**	10.42***
		(1.15)	(2.94)	(3.64)

Legend: † $p \lesssim .08$ * $p \lesssim .05$ ** $p \lesssim .01$ *** $p \lesssim .001$ 2df (1-tailed)

It is worth mentioning that these comparative results make it quite difficult to maintain an argument for a linguistically elicited motherese as the fine-tuning position does. According to that position, there should be significant results between input to the child and aspects of the child's language, particularly on the syntactic level; only if such a case obtains can we conclude that input caters to the child's linguistic needs. In comparisons within the same type, AII differs significantly from either AN or AF on 5 and 6 syntactic parameters respectively. If we wished to maintain the hypothesis, we would have to obtain a larger number of significances for AF than for AN. We do not. Indeed, even in comparisons across types, AI differs from both AN and AF on exactly the same number of syntactic parameters, 15 in both cases. However, we may still argue that the differences are not on exactly the same parameters. And indeed they are not. Nevertheless, a quick look at Tables 5.6 and 5.8 shows that the significant differences are away from the previously established criterion of simplicity. Rather, those significant differences are a function of the discourse. In desiring more interaction with the foreigners, the teachers elicit and repeat many questions; the increase in repetition is related to an increase in the proportion of questions which, in turn, leaves a minimum sentence on average between turns, thereby creating the consistent result of a significant mut difference in the comparisons. It is this product of responsive/interactive discourse which creates the slightly different significant distribution in relation to the foreigners.

Finally, the predictions which have been tested in this section

are, in general, met. Indeed, the syntactic profile of AII demonstrates that there are cases when adults receive a short mlu and a low complexity index, whereas the child, in some cases, may receive a long mlu with a high complexity index, as in AB. The properties of input seem to depend more on the function of speech than on the attributes of the addressee as the fine-tuning hypothesis had assumed. It is most likely, then, that adults adjust primarily to the system of verbal interaction, or indeed to the type of speech which best encodes their purposes, and quite secondarily or indirectly to the nature of the addressee.

CHAPTER SIX - Conclusion

I. Summary

The experiment in this dissertation was originally designed as a direct test of the fine-tuning hypothesis. As summarized by Cross (1977), the hypothesis states that adult speech to a child is closely tailored to the child's linguistic requirements. It predicts a high degree of correlation between mothers' speech features and the child's ability at all descriptive levels, particularly the syntactic. According to this position, the significant differences between adult-to-adult speech and adult-to-child speech, or motherese, are viewed as listener-dependent syntactic adjustments which result in a simple corpus for learning syntax. This didactic view has been challenged by Newport (1976). She proposes, instead, a multi-factor hypothesis which argues that as mother's speech is shaped by a multiplicity of purposes -- controlling and communicating with a cognitively and linguistically naive listener -- it is not perfectly tuned at any level.

The present study was designed with a view to providing evidence in support of the fine-tuning hypothesis. It isolated, experimentally, the linguistic variable from the child's age by using an age-matched pair design. Three Arabic second-language English learners were matched with three Scottish first-language learners of similar ages. Thus each child in the pair of 2-, 3- and 5-years old had a similar age match, but of different language

sophistication. Each age-pair interacted with its respective adult teacher for a longitudinal period of 5 to 7 months. Each foreign child scored significantly differently on measures of production and comprehension from his native match.

In line with criteria of simplicity gleaned from theoretical prespectives and described by Newport et al. (1977), evidence for the position of simpler input to simpler listeners was expected to emerge. Simplicity in description of input should have yielded significantly more complete and canonical sentences to the foreigners than to the native children as well as significantly fewer fragments, proportionately fewer rearranged and deleted constituents and significantly lower complexity indices. Moreover, simplicity in presentation should have produced a corpus with narrow-ranging surface sentence types and with gradual and systematic changes towards long and complex sentences. Whereas comparisons between input to foreigners and to natives registered a limited number of significant differences on the syntactic level of analysis (only 6 out of 29 parameters), these were away from the criteria of syntactic simplicity. Moreover, there were no significant differences between the significantly different listeners on the parameters of mlu and complexity which are the cornerstone of a fine-tuning hypothesis. In general, the results for the independent variable of linguistic stage did not exhibit a significant effect on adults' speech. The results suggest that speakers do not make syntactic adjustments in a fine-tuned relation to their listeners' sophistication.

However, the literature emphatically reports that there are dramatic changes from A/A to A/C, which implies that it is the listener who controls them. In discounting the fine-tuning position, and in an attempt to explain the motherese phenomenon, a new hypothesis was formulated. The design of the present work allowed several tests for its validity.

The functional hypothesis states that it is the functions to which the speaker directs his language which govern the syntactic and discoursal profile of input to the learner. The data was reanalyzed to isolate the two types of functions: informative/expressive speech and responsive/interactive speech. The new independent variable of speech types has been tested in Chapter Five. Holding the child addressee constant and varying the types of speech revealed 21 significant differences on syntactic parameters for the natives and 22 significant differences on syntactic measures for the foreigners. By isolating the independent variable of types of speech we have reproduced a sizeable number of motherese effects to the same child listener.

Further consolidation of the functional hypothesis was found in comparisons between informative / expressive function and responsive / interactive function in adult-to-adult speech. The tests yielded 16 significant syntactic differences between the two types of functions. Once again we reproduced motherese effects to the adult listener in the absence of the child.

Table 6.1 provides a summary of overall comparative results for

Table 6.1 - Summary of comparative analysis for overall results for types of addressee (fine-tuning hypothesis) and types of speech (functional hypothesis).

Adult Speech Parameters		Within Type Comparison				Across Type Comparison				
		II			I	II / I				
		AII/AN	AII/AF	AN/AF	AI/AB	AII/AI	AN/AI	AF/AI	AN/AB	AF/AB
Overall	Mean Length of Utterance	<	<	<	>	<*	<*	<*	<***	<***
	Mean Number of Utterance /turn	>	>**	>***	>	<*	<*	<*	<***	<***
	Sentence	<	<	<	<	<†	<	<	<***	<***
	Fragment	>	>	>	>	>*	>	>	>**	>***
	Interjection	>	>	>	>	>	>	>	>***	>**
Surface Structure Type	Declarative (Total)	>	>*	>**	>*	<**	<**	<***	<***	<***
	Declarative	>	>**	>*	>**	<**	<**	<***	<***	<***
	Deictic	<	<	>	<	>	>*	>*	<	.<
	Fragment Declarative	>	>	>	>*	>	>	<	>*	>
	Imperative (Total)	<	<	>	<	>*	>	>	<	<
	+ Imperative	<	<	>	<	>**	>	>	<*	<*
	- Imperative	<	<	e	e	e	>	>	>	>
	Imperative + Subject	<+	<	>	<	>	>*	>	>**	>*
	Fragment Imperative	<	<	>	<	e	>	>	<	<

Legend: > greater than
< smaller than
e no result
* $p \lesssim .05$ ** $p \lesssim .01$ *** $p \lesssim .001$ (one-tailed)
† $p \lesssim .08$

Table 6.1 - (cont'd) Summary of comparative analysis for overall results for types of addressee (fine-tuning hypothesis) and types of speech (functional hypothesis).

Adult Speech Parameters		Within Type Comparison				Across Type Comparison				
		II			I	II / I				
		AII/AN	AII/AF	AN/AF	AI/AB	AII/AI	AN/AI	AF/AI	AN/AB	AF/AB
Surface Structure Type	Questions (Total)	< +	< **	< **	< **	> *	> **	> **	> ***	> ***
	Wh-questions	< +	<	<	< +	> +	> *	> *	>	> **
	Wh-final	>	>	>	<	>	>	>	>	>
	Aux. yes/no	<	< **	< *	< **	> *	> **	> *	> **	> ***
	Raised Verb	<	<	<	<	ϴ	>	>	<	>
	Raised Intonation	<	<	<	<	>	> *	> *	> ***	> ***
	Declarative + Tag	<	>	>	< *	>	> †	> †	< *	< *
	Tag	< +	< +	<	ϴ	ϴ	> †	> †	> ***	> ***
	Fragment Question	>	<	<	>	> †	>	> *	> ***	> ***
Complexity	Present	<	>	>	<	<	<	<	< **	< **
	Past	< *	<	<	> †	< *	< †	< **	> **	> *
	Future	>	>	>	<	>	>	<	<	< *
	Verbless Utterances	>	>	>	>	> †	>	>	> ***	> ***
	Multiproposition	>	>	<	>	< **	< *	< *	< ***	< **
	S/node/sentence	>	>	<	> *	< **	< **	< **	< ***	< ***
Discourse Measures	Imitation (Total)	< *	<	> *	ϴ	> †	> *	> **	> *	> **
	Imitation	<	<	> *	ϴ	> **	>	>	>	>
	Transformed	<	<	> *	ϴ	>	>	> *	>	> *
	Correction (Total	< **	< **	< **	ϴ	ϴ	> **	> **	> ***	> ***
	Syntactic	<	<	< *	ϴ	ϴ	>	>	>	>
	Semantic	< +	< *	<	ϴ	ϴ	> †	> *	> *	> *
	Rephrase	< *	<	< *	ϴ	ϴ	> *	>	> *	>
	Repetition (Total)	< **	< **	< ***	< **	< **	<	> *	<	< *
	Repetition	>	<	< *	<	<	<	<	<	<
	Transformed	<	< *	< **	<	<	> †	> *	> *	> *
	Paraphrase	< **	< ***	< ***	< *	< **	<	>	<	<

Legend: † $p \lesssim .08$ * $p \lesssim .05$ ** $p \lesssim .01$ *** $p \lesssim .001$ (one-tailed)
ϴ no result > greater than < smaller than

the fine-tuning hypothesis (types of addressees). As we move from the left to the right of the table, the number of significant results is concentrated around the functional hypothesis. Moreover, Table 6.1 shows the results of tests carried out in Chapter Five, Section V. These results explain why previous researchers were led to posit a fine-tuned notion on account of comparisons between dissimilar data baselines.

The results obtained for the functional theory seem better equipped than either the fine-tuning or the multi-factor hypotheses to account for the properties of motherese. The variable of the listener's sophistication does not provide evidence for the fine-tuned position, nor does the interpretation of multiplicity of purposes lend great support to the multi-factor position. If motherese arises from the communicative needs of directing and talking to the linguisticaly and cognitively naive listener, then motherese-like effects should not occur in the presence of adults of equal status and abilities. That we have identified two types of speech in adult-to-adult language, and that we have created motherese effects for the adult in comparing two characteristic functions, is further evidence that types of speech determine the syntactic and rhetorical properties of speech addressed to children.

The functional theory is further corroborated by McDonald and Pien (1982) who reached a somewhat comparable position to the present one. The authors coded only A/C samples according to the interactional intent of mothers, commanding the child or conversing

with him in line with Newport's position (1976). Although their analysis does not use formal features but illocutionary acts, they report a significant cluster between commands and requests dependent on the intent of the mother.

The present study, which makes use of formal and rhetorical classifications for both A/A and A/C samples, does find a cluster of features associated with the speech functions. Moreover, this study argues that motherese effects arise and are magnified in comparisons between A/A and A/C across dissimilar types of speech. Moderate to low effects, on the other hand, occur when comparisons between A/A and A/C are carried out within similar speech types.

Table 6.1 shows the large effects, which are reported in the literature as listener-dependent, to be the effect of inappropriate base-line comparisons. However, even when effects occur within similar type comparisons they are a function of increased repetitions which lead to increased questions and a shorter number of utterances before turns. It is in that limited area of discourse that we find support for Newport's multi-factor hypothesis. The increase in repetitions effects the increase in questions and the decrease of muts.

II. Implication of the functional hypothesis.

In Chapter Two, Section V.A., we have argued that the fine-tuning hypothesis depends wholly on the speaker's precise perception of his listener's linguistic needs. We have also

pointed out that any failure to cater for these needs exposes the child to the risk of linguistic deprivation. The speaker may fail to replace, at the appropriate time, previously omitted structures; he may also fail to guess which step to take and in which direction, and consequently, he may fail to introduce gradual and systematic new models. He would thereby produce a corpus too difficult or too easy to aid acquisition.

The functional hypothesis presented and tested in this study provides an improved vista on previous positions. The hypothesis demonstrates that short or long sentences, fragmentary or complete ones, wide-ranging or restricted sentence type, single or multiple propositions, dramatically vary according to the conversational purposes of the speaker. In the informative/expressive function, the speaker will occupy the floor in order to pass information to his listener. In doing so, there is a prevalence of descriptive statements, long turns and a narrow range of surface sentence types. Depending upon the complexity of his information, the index of complexity will vary. As the speaker engages in an almost monologue sequence, he dominates the interaction and releases few speaking turns to his addressee.

In the responsive/interactive function, the speaker releases many speaking turns, constantly responds to his listener and seizes every opportunity to promote further interaction. Consequently, sentences are short, interrupted or incomplete, the context of reference is always clear and the topic of the interaction is identifiable. In responding and eliciting interaction from the

interlocutor, there will be a wide-ranging surface sentence type, a prevalence of questions, a decrease in mut and finally a low complexity ratio. Responsive/interactive speech will proceed in dialogue sequences of frequent turns alternating between speaker and listener. The syntactic features of responsive/interactive discourse will have a less mature profile than the more mature one of informative/expressive discourse (as seen in Chapter Five).

Consequently, the functional hypothesis is not based on the perceptions of the speaker but rather on the structure of discourse in the language. It therefore does not account for the development of child-directed speech in syntactic terms, as Newport or Cross suggest, but rather in discoursal ones. Cross claims that adult-to-child speech, especially mlu, grows in a finely-tuned manner. It keeps a step ahead of the child's mlu until A/C mlu reaches that of adult-to-adult speech. Newport, on the other hand, interprets the length of mlu over time, as well as the increase of declarative structures, in particular, to be the product of syntactic operations. Mothers gradually replace into surface structures previously omitted constituents. Such operations increase the length of sentences and transform deformed surface structures into canonical ones. Although Newport claims to hold a different position from the fine-tuning one, the omission and replacement over time is again essentially a fine-tuned syntactic explanation. The new developmental position which emanates from the functional hypothesis is different. As the informative/expressive function is related to the dominance of the speaker in a monologue sequence, and as the responsive/interactive

function is related to the engagement of the speaker and listener in a dialogue sequence, the mismatch of these two functions or monologue and dialogue will create a developmental pattern over time. The closer the discourse is to one function, the more distinct its syntactic profile will be to the properties of this function. The reverse is also true. In other words, the more interactive the adult becomes, the more dialogue will take place and the less mature his language would be. The more informative the adult becomes, the more monologue will take place and the more mature his language would be. The mismatch or alternation between the two different functions will produce a pattern of change in the syntactic profile of the language that would always be associated with age.

The functional theory, then, offers a broader implication to language acquisition than previous theories. In this new view the child is not at the extreme disadvantage of a fine-tuned theory or a multi-factor one. The functional theory argues that the child will be exposed to two types of inputs associated with the contextual constraints of the conversation. In certain situations, one function may be prevalent; in another situation, another will predominate, and in a third situation both functions might be proportionately represented. In either type of discourse, the child would find at his disposal enough examples of syntactic structures related to the purposes of the conversation in specific situations. This match between function and form in specific situations provides the child with opportunities of mapping meaning on to forms. In other words, provided that the child receives both

types of input functions which contain characteristic features of adult speech, he would be exposed to rich and varied language examples which are complimentary to each other.

This position, then, does not leave the child at the mercy of the adult's linguistic knowledge or lack of it. Neither does it leave the child at the mercy of the acute or defective perceptions of the speaker; rather, the totality of the environment is expected to compensate for whichever complexity inherent in each function. If the child's input is not biased towards one function only, he may, himself, make gains when he is ready to do so. As such, the relationship between the adult and the child as seen in a functional theory is one of a partnership.

Several worthwhile investigations arise from this new position. It is indeed possible that children employ different perceptual strategies in processing short or long discourse types; an investigation along those lines might prove beneficial. It is also probable that each type of speech makes different verbal and intellectual demands on the child. It is expected that informative/expressive speech stimulates intellectual and cognitive faculties which the child needs in entering the thinking world. The child needs to learn how to express himself informatively rather than destructively. It is also expected that responsive/interactive speech stimulates the development of verbal skills which signal the child's belonging to the speech community. In exposing the child to both types, both faculties are being developed. Indeed it might be the case that children with lower

socio-economic backgrounds might not be exposed to balanced proportions of these types of speech. It would be of use to investigate whether or not this proposal is valid in relation to their development in expressive abilities.

Finally, it might be interesting to examine how far these two types are related to the child's subsequent development. Nelson (1973) proposed two types of learners: the referential and the expressive type. Perhaps the frequency of one type of speech as opposed to another might be related to the emergence of one type of learner as opposed to another. The functional hypothesis therefore suggests an alternative view to the relevance of input to language acquisition.

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Appendix A: Tape number of the English corpus and the corresponding child's age.

Age pair 2:	1 - November 1978	26 months
	2 - December 1978	27 months
	3 - January 1979	28 months
	4 - February 1979	29 months
	5 - March 1979	30 months
	6 - April 1979	31 months
	7 - May 1979	32 months
Age pair 3:	8 - February 1979	35 months
	9 - March 1979	36 months
	10 - April 1979	37 months
	11 - May 1979	38 months
	12 - June 1979	39 months
Age pair 5:	13 - December 1978	66 months
	14 - January 1979	67 months
	15 - February 1979	68 months
	16 - March 1979	69 months
	17 - April 1979	70 months
	18 - May 1979	71 months
	19 - June 1979	72 months

Appendix B: Instructions for transcription

1. Listen to big portions of speech on tape to understand what is being talked about. E's voice will explain the context of activities.

2. Transcribe adult speech on the left hand side of the column in English orthography.

3. Mark portions which you are unable to identify as a blank in parenthesis.

4. For portions which you have guessed at, write your guess in parenthesis.

5. Use a full stop when you feel the speaker has finished his sentence.

6. Use an interrogative mark when you feel that the speaker is asking about something.

7. Use 2 dots for a short pause. Indicate a long pause by either writing the word pause in parenthesis or as a series of dots.

8. Now listen to what one child said and transcribe it orthographically.

9. Write what each child said on a separate line even if it is one word, i.e. 'yes', 'no', 'look' or a name.

10. Mark the line as F and N according to the child speaking. F_1 has a coarser voice than N_1. F_2 has a slight stammer and pronounces 'r' as a 'g' sound. F_3 has a coarser voice than N_3. If both children speak at nearly the same time, listen to what each one says and write down each at one time.

11. Having completed the page, please listen to it again as a whole to check on your transcription and/or your queries.

Thank you.

Appendix C: Notes on Utterance Segmentation

The following notes were used in the analysis: (1 to 4 supplied by Wells (1975), p.30).

1. Paratactic sentences linked by 'and' are treated as one utterance where there is a clear semantic link between the sentences, but where a string of sentences is linked by 'and' or 'and then' (as in child narrative) each one is treated as a separate utterance.

2. 'Yes' and 'No' in initial position are treated as part of an utterance if they simply reinforce the meaning of the utterance; otherwise they are treated as separate utterances.

3. Tags of all kinds (e.g. isn't it?, see, you know) and vocatives are included in the utterance to which they are attached.

4. Reasons and justification given in support of commands and statements, etc. should be included with the utterance they support, unless they are separated from the utterance by an intervening utterance or long pause.

5. Tags which are not attached to a sentence, i.e. representing one speaker's turn, are counted as a separate unit.

6. One- or two-word replies or repetitions were counted as separate units in as much as a separate intonation contour distinguished them as recognizable text-sentence in correspondence with a single system-sentence.

   e.g. Teacher: a Vauxhall?

   or

   Teacher: good boy!

Appendix D: Brown's (1973) instructions for counting mlu in morphemes in child's language. Amendments to the first rule are in parenthesis.

1. Start with the second page of the transcription unless that page involves a recitation of some kind. In this latter case, start with the first recitation - free stretch. Count the first 100 utterances satisfying the following rules. (Two amendments were introduced: Firstly, in order to analyze a manageable number of utterances over the whole period of observation, 50 utterances only were taken at each sampling point. Secondly, the first five minutes of tape were not included in the analysis to allow enough time for the conversation between the adult and the child to be picked up. Speech occurring exactly after the first five minutes of recording was an objective criterion set for the analysis of both adult and child speech; it coincided to the fifth page of transcription. Both these amendments were applied to the analysis of adult and child samples.)

2. Only fully transcribed utterances are used; none with blanks. Portions of utterances, entered in parenthesis to indicate doubtful transcriptions, are used.

3. Include all exact utterance repetitions (marked with a plus sign in records). Stuttering is marked as repeated efforts at a single word; count the word once in the most complete form produced. In the few cases where a word is produced for emphasis or the like (no, no, no) count each occurence.

4. Do not count such fillers as mm or oh, but do count no, yeah and hi.

5. All compound words (two or more free morphemes), proper names and ritualized reduplications count as single words. Examples: birthday, rackety-boom, choo-choo, quack-quack, night-night, pocket book, see saw. Justification is that there is no evidence that the constituent morphemes function as such for these children.

6. Count as one morpheme all irregular pasts of the verb (got, did, went, saw). Justification is that there is no evidence that the child relates these to present forms.

Appendix D: (cont'd) - Brown's (1973) instructions for counting mlu in morphemes in child language. Amendments to the first rule are in parenthesis.

7. Count as one morpheme all diminutives (doggie, mommie) because these children at least do not seem to use the suffix productively. Diminutives are the standard forms used by the child.

8. Count as separate morphemes all auxiliaries (is, have, will, can, must, would). Also all catenatives: gonna, wanna, hafta. These latter counted as single morphemes rather than going to or want to because evidence is that they function so for the children. Count as separate morphemes all inflections, for example, possissive (s), plural (s), third person singular (s), regular past (d), progressive (ing).

Appendix E: Test for judges' assessment

A

The following exchange is between a teacher and a child. Please read carefully to decide if the child's response shows an understanding of what the teacher said. Put a tick under the correct column.

	Teacher	Child's Response	Does the child understand? Yes	No
1.	What did you have to eat when you were at home?	I had lots of things at my house, honey and bread		
2.	Did you go anywhere special at the weekend?	I went to William's house		
3.	What colour's that?	Red		
4.	Have you ever been in a train?	You went in to aeroplane like me.		
5.	What are you getting on the table for?	Getting to find the other number.		
6.	Where did you go at the week-end?	em went home.		
7.	What was for dinner today?	I eated dinner.		
8.	Your mummy is going to have a baby isn't she?	My room is going to get bigger.		
9.	What are you making?	I'm making a house for you.		
10.	What's that?	A Xmas tree.		
11.	Did you go to feed the ducks or go shopping?	I fed the ducks.		
12.	Have you made your house now?	I finish make house.		
13.	Who brought you in the car this morning?	My daddy.		
14.	Do you want me to put it anywhere?	Yes put it there.		
15.	You show me what you want me to do.	I can't fix that for you.		
16.	When is he coming to your house?	I'm going to his house.		

A

	Teacher	Child's Response	Does the child understand? Yes	No
17.	What was for dinner today?	I ate my apple sponge and my dinner all up.		
18.	Did you go to feed the ducks or go shopping?	I gave bread to the ducks.		
19.	What comes after 2?	3, 4, 5, 6		
20.	Where did you say you got your dress from?	From some friends in Ireland.		
21.	Had you been at home or had you been somewhere else before you come?	I'd been asleep.		
22.	He's not green is he?	No but the other one is green.		
23.	What does the red one tell you to do?	You do that.		
24.	What have you made?	I making on blue.		
25.	What did I paint on the window upstairs?	It was snowman.		
26.	Tell her where your mummy is?	My mummy is in the hospital		
27.	What is he getting out?	His hands out.		
28.	What are you going to make?	On a house.		
29.	Were you playing outside?	I was fall on the toys.		
30.	Who else went with you?	Lucy and David.		
31.	Where did you go on an aeroplane?	I went in to hospital.		
32.	Do you want to come to my house?	There's Vicky.		
33.	What's this?	A bear.		
34.	What are you trying to do.	The man is there and the man is in the attic.		

Teacher	Child's Response	Does the child understand? Yes	No
35. What does a fire engine say?	Da do da do da do.		
36. What colour are they?	Green and orange.		
37. Who's crying?	Samantha crying.		
38. Where is he going?	On a car.		
39. What will happen when you come to my house?	I'm coming to your house.		
40. Where did you go?	Uncle Sam coming for me.		
41. What are you making?	A fire engine.		
42. Do you know which book this is?	That's Mr. Nosey.		
43. Do you know who this is?	It's a boy.		
44. Did you have it in the house?	I had it in the house.		
45. You're going to use that?	That's yours.		
46. Has he gone to work?	That's shanta.		
47. Who did it?	It wasn't me.		
48. How many windows?	It on a house.		
49. What is it?	This one on the chair.		
50. Do you know where're you going for your holiday?	I didn't went for holiday.		
51. Do they live there all the time?	They were born in England.		
52. What other toys do you have at home?	Mickey Mouse.		
53. Why is mummy in hospital?	She's not good.		
54. What is he doing?	He's biting his neck.		
55. You're trying to make a house for who?	For you as a present.		
56. What did you have to eat when you were at home?	Dinner.		
57. When will you get your Kaola?	When daddy comes.		
58. Do you know which book this is?	That's Mr. Nosey.		
59. What else for breakfast?	My daddy make marmalade.		
60. Why don't you sleep in your own bed?	I don't.		

B

The following exchange is between a teacher and a child. Please read carefully to decide if the child's response shows an understanding of what the teacher said. Put a tick under the correct column.

	Teacher	Child's Response	Does the child understand ? Yes	No
1.	What are these?	Monkey		
2.	What does it feel like?	only feel mine is mixed		
3.	What's the pig's name?	Polly		
4.	They're all different monkeys aren't they?	This is a silly monkey		
5.	What are we going to do with it?	can eat it		
6.	What's the sugar for?	For your tea		
7.	What's he doing?	He's laughing		
8.	Do you know what it's called?	Zebra		
9.	How many boxes?	one, two		
10.	What's the boy doing?	Don't know		
11.	Why are there fences around?	a monkey		
12.	What's that mixture you're putting in?	I'm making fish and chips		
13.	Which colour would you like?	This one		
14.	What did we use to make the dough?	It is the birthday cake		
15.	What were they doing at the zoo?	They're walking		
16.	How many do you want?	Two		
17.	Is it white?	No, it is black		
18.	Did you see any penguins yesterday?	I see penguins		
19.	What's the pig's name?	Polly		
20.	What colour's the flour?	white		
21.	What do you have to do?	That's a ball to kick it		
22.	How many are on the table?	one		
23.	What's it called?	a push chair		
24.	What noise does the duck make?	cluck, cluck, cluck		
25.	Do you know what these are?	baby lions		
26.	What do we call this?	elephant		

B

	Teacher	Child's Response	Does the child understand ? Yes	No
27.	What colour is the salt?	Blue		
28.	What's his long big nose called?	water in his nose		
29.	What will you put more?	water		
30.	How many bowls have you got?	three		
31.	What is he going to do?	to buy me a tail		
32.	What does it feel like if it is not soft?	like they make		
33.	Have you been to the zoo?	I don't been to the zoo		
34.	I got a bigger bit this time haven't I?	I'm sticking on it		
35.	and who's that?	it's a pig		
36.	What else has he got?	big tall nose		
37.	What's that?	birthday		
38.	What's she got on?	A hat		
39.	Is he three then?	two		
40.	What's happened to it?	don't know		
41.	What's the baby sitting in?	a cot		
42.	Parrots can eat nuts can't they?	I eat something		
43.	We had fish on Friday didn't we?	when we have dinner		
44.	What colour's yours?	yellow		
45.	How do you know its's a giraffe?	it is		
46.	What's that one doing?	elephant		
47.	I wonder what we could use for the candle	you know what you could do. Put this off.		
48.	What are you making?	coffee		
49.	Is this your book?	yes, mummy bought it		
50.	What do you have to do?	put it in the water		
51.	Do you think you need a wee bit more water?	I think I need more water		
52.	What noise was he making?	I don't know		
53.	What is it doing with the water?	spitting out of his trunk		

B

	Teacher	Child's Response	Does the child understand ? Yes	No
54.	Do you know what that is?	sugar		
55.	What's that?	a birthday cake		
56.	What are these?	penguins		
57.	Was it because the sand was dry?	you make it when it is wet		
58.	People like to look at Pandas don't they?	when I was at caravan I saw Panda		
59.	Do they have cooked fish?	I am going to have fish		
60.	How long do you think it'll take the cake to be ready?	five.		

Appendix E: (continued)

C

The following exchange is between a teacher and a child. Please read carefully to decide if the child's response shows an understanding of what the teacher said. Put a tick under the correct column.

	Teacher	Child's Response	Does the child understand? Yes	No
1.	When do you have candles?	For Xmas.		
2.	How does he mess up your room?	He throws things that are in his room into my room.		
3.	Has he said what he wants from Santa?	Yes an electric train.		
4.	What's the next one?	Rattle.		
5.	What kind of party?	A party in the house.		
6.	Do you not like carrots?	No .. er .. I like raw carrots.		
7.	What else in the room has got a handle?	The rod bag.		
8.	Does she put it on the gas or the electric stove?	She just puts it in the tea pot.		
9.	What do we do at the service?	We sing.		
10.	What do you usually do on Xmas day?	We just sometimes. If it is a Tuesday we go shopping.		
11.	When do you have candles specially for you?	Birthday.		
12.	Have you seen the Xmas tree all lit up?	It's too big to put.		
13.	What kind of noise did it make?	It make something like somebody bang.		
14.	I don't suppose he would like you laughing at him would he?	If I do something funny he laughs as well.		
15.	What do you do with a violin?	You just put it on your neck and do like that.		
16.	You know what a bundle is don't you?	A bundle of clothes.		
17.	Who uses a saddle?	Horse.		
18.	How many candles did you have for your last birthday cake?	Four ... no five.		
19.	What do you like doing best of all?	I want to drawing.		

C

	Teacher	Child's Response	Does the child understand ? Yes	No
20.	What kind of songs?	Hymns.		
21.	What do you think we should do with the frogs?	Put them back in the pond.		
22.	What do we sing?	Any kind of song.		
23.	What do you like for your favourite tea?	I like the biscuit.		
24.	What would you do at Xmas time?	I not see the Xmas at Egypt.		
25.	What pictures do you like to paint?	Castles with soldiers.		
26.	What's a fiddle?	It's like a violin.		
27.	What would you like to do in your holidays?	I went to safari Park.		
28.	Who did you live there with?	Number ten.		
29.	How's your brother getting on?	Fine.		
30.	What did you have for lunch?	I had sandwiches.		
31.	Who can you cuddle?	I don't know.		
32.	What's your favourite toy?	Something for the birthday.		
33.	Are you going to hang up your stocking?	I put it on a little table beside my bed.		
34.	What do you think it was doing in the lilac?	Eating the leaves.		
35.	And what do you want from Santa?	A tree house.		
36.	Which nursery school did you go to?	The nursery just behind the school.		
37.	What do you do with Xmas cards?	I get some.		
38.	But you get different things apart from biscuits .. mum?	I like the chocolate.		
39.	Who bought you your Mr. Strong pencil?	I got it from a party.		
40.	What do you do with Xmas cards?	Well when we've got all of our Xmas cards we hang them up on the wall.		

C

	Teacher	Child's Response	Does the child understand ? Yes	No
41.	What are you going to buy for Mummy?	I don't know yet.		
42.	Who uses a saddle?	to let the man sit.		
43.	What else in the room has got a handle?	that door over there.		
44.	What do you think you'll do in the holiday?	I've written down a list: ski-ing, skating and swimming.		
45.	What did you have for your play-piece yesterday?	Apple.		
46.	What's your favourite school dinner?	Potato and meat cutting.		
47.	What other games have you got at home?	Badminton.		
48.	You didn't learn any songs at school?	But the school was in Egypt.		
49.	Have you made up your mind what you're going to buy?	I don't know what can I give Mummy.		
50.	What do we call it?	A cardigan.		
51.	How's your brother getting on?	He always messes my room.		
52.	What kind of a kettle do you have at home?	A kettle have handle.		
53.	What's the next one?	Kettle.		
54.	What did you have for lunch?	I got a pie.		
55.	Where did you see a flying saucer?	I can't remember where it was.		
56.	When do you have candles specially?	For the birthday.		
57.	What did you do there?	We had painting, drawing and sand, and you could do baking.		
58.	Do you know of a little boy who had a candle?	Wee Willie Winkie.		
59.	What picture's on your jigsaw puzzle	There's two boys running, something like ..		
60.	Who do you know at Alexandria?	Some of our friends up there.		

APPENDIX F: Assessment of twenty judges' comprehension score for age pair 2 (26 to 32 months).

		Judges' assessment score of children's comprehension (score out of 10 items)																					
Stage	Pair 2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Mean# (S.D.)	Mean% (S.D.)
Beginning	F	4	3	3	2	5	7	5	6	6	3	3	3	5	3	4	5	5	4	5	3	*** 4.20 (1.32)	*** 42.00 (13.20)
	N	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	8	9	9	8.95 (0.22)	89.50 (2.20)
Middle	F	6	2	4	7	7	6	7	7	7	6	3	2	7	2	5	6	6	4	5	2	*** 5.05 (1.93)	*** 50.50 (19.30)
	N	8	4	6	8	8	7	9	8	8	7	4	5	7	7	7	7	7	6	5	6	6.70 (1.38)	67.00 (13.80)
End	F	6	5	4	6	7	6	6	6	6	5	5	4	5	4	6	7	6	5	7	4	*** 5.50 (1.00)	*** 55.00 (10.00)
	N	9	8	7	9	8	8	10	9	9	9	7	6	9	7	7	9	7	7	8	8	8.05 (1.05)	80.50 (10.50)
Overall	F	16	10	11	15	19	19	18	19	19	14	11	9	17	9	15	18	17	13	17	9	*** 14.75 (3.72)	*** 49.17 (12.40)
	N	26	21	22	26	25	24	28	26	26	25	20	20	25	23	23	25	23	21	22	23	23.70 (2.25)	79.00 (7.50)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed)

APPENDIX F: (Cont'd) Assessment of twenty judges' comprehension score for age pair 3 (35 to 39 months).

		Judges' assessment score of children's comprehension (score out of 10 items)																					
Stage	Pair 3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Mean% (S.D.)	Mean% (S.D.)
Beginning	F	7	5	6	8	8	7	7	7	7	7	8	6	6	6	7	8	7	7	8	6	*** 6.90 (0.85	*** 69.00 (8.50)
	N	9	8	9	9	10	10	10	9	10	10	8	8	10	9	10	10	9	9	10	8	9.25 (0.78)	92.50 (7.80)
Middle	F	7	7	4	6	7	7	8	5	9	8	7	5	7	5	7	8	6	6	8	6	*** 6.65 (1.27)	*** 66.50 (12.70)
	N	8	7	6	7	9	7	9	7	9	8	7	6	9	7	8	10	8	8	7	7	7.70 (1.08)	77.00 (10.80)
End	F	7	7	6	8	8	8	8	7	8	7	9	6	5	6	7	8	5	5	7	8	7.00 (1.17)	77.00 (11.70)
	N	6	6	6	9	8	7	8	7	8	8	8	5	8	6	7	8	7	7	9	7	7.25 (1.07)	72.50 (10.70)
Overall	F	21	19	16	22	23	22	23	19	24	22	24	17	18	17	21	24	18	18	23	20	*** 20.55 (2.62)	*** 68.50 (8.70)
	N	23	21	21	25	27	24	27	23	27	26	23	19	27	22	25	28	24	24	26	22	24.20 (2.46)	80.70 (8.20)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed)

APPENDIX F: (Cont'd) Assessment of twenty judges' comprehension score for age pair 5 (66 to 72 months).

		Judges' assessment score of children's comprehension (score out of 10 items)																					
Stage	Pair 5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Mean (S.D.)	Mean % (S.D.)
Beginning	F	6	3	2	4	6	6	6	3	7	6	2	1	5	2	5	6	6	5	5	4	*** 4.50 (1.76)	*** 45.00 (17.60)
	N	9	9	9	9	9	10	9	8	9	10	9	8	8	9	9	9	9	9	9	9	8.95 (0.51)	89.50 (5.10)
Middle	F	8	5	9	9	10	10	9	9	10	7	9	8	9	7	8	10	9	8	8	8	8.50 (1.23)	85.00 (12.30)
	N	10	8	7	10	8	9	8	10	9	9	8	9	9	8	10	9	10	8	9	8	8.80 (0.89)	88.00 (8.90)
End	F	8	7	5	10	7	9	9	7	9	9	6	6	9	6	8	8	8	7	7	7	*** 7.60 (1.31)	*** 76.00 (13.10)
	N	10	9	9	10	9	9	9	9	10	9	9	9	9	9	10	10	10	9	9	9	9.30 (0.47)	93.00 (4.70)
Overall	F	22	15	16	23	23	25	24	19	26	22	17	15	23	15	21	24	23	20	20	19	*** 20.60 (3.50)	*** 68.70 (11.70)
	N	29	26	25	29	26	28	26	27	28	28	26	26	26	26	29	28	29	26	27	26	27.05 (1.31)	90.20 (4.40)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed)

APPENDIX G: Monthly Records for children's linguistic and comprehension parameters: Means, (Standard Deviation) and Rate of Development for N & F in age-pair 2.

	Child Speech Parameters	November 26 month		December 27 month		January 28 month		February 29 month		March 30 month		April 31 month		May 32 month		Means (S.D.)		Rate of Development (+ Faster)	
		N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F
Language Ability	Mean Length of Utterance	3.12	2.16	3.58	2.64	3.54	2.44	3.50	2.70	3.60	2.90	3.90	3.30	4.10	3.30	3.62 (0.31)	2.78*** (0.42)	0.13	0.18 (+)
	Verb/Utterance	0.38	0.52	0.44	0.36	0.58	0.32	0.64	0.32	0.60	0.52	0.68	0.80	0.36	0.72	0.53 (0.13)	0.51 (0.19)	0.02	0.06 (+)
	Noun/Utterance	0.28	0.08	0.80	0.42	0.44	0.46	0.52	0.40	0.40	0.24	0.64	0.24	1.02	0.42	0.59 (0.25)	0.32* (0.14)	0.06 (+)	0.02
	Pronoun/ Utterance	0.34	0.16	0.42	0.34	0.76	0.50	0.40	0.38	0.56	0.44	0.64	0.66	0.30	0.42	0.49 (0.17)	0.41 (0.15)	0.02	0.06 (+)
	Copula/Utterance	0.24	0.00	0.04	0.08	0.06	0.10	0.06	0.04	0.26	0.10	0.10	0.08	0.30	0.06	0.15 (0.11)	0.07* (0.04)	0.01	0.01
	Total/Utterance	1.24	0.76	1.70	1.20	1.84	1.38	1.62	1.14	1.82	1.30	2.06	1.78	1.98	1.62	1.75 (0.27)	1.31** (0.33)	0.11	0.14 (+)
	Auxiliary/Verb	0.42	0.00	0.09	0.05	0.17	0.06	0.21	0.06	0.13	0.07	0.38	0.07	0.38	0.22	0.25 (0.14)	0.08** (0.07)	0.02	0.02
	Inflection/Verb	0.21	0.19	0.27	0.44	0.10	0.12	0.37	0.25	0.30	0.30	0.23	0.10	0.16	0.11	0.23 (0.09)	0.22 (0.12)	-0.01 (+)	-0.04
	Inflection/Noun	0.07	0.00	0.20	0.04	0.04	0.00	0.11	0.05	0.15	0.00	0.10	0.17	0.11	0.04	0.11 (0.05)	0.04* (0.06)	-0.01	0.02 (+)
	Total/Verb, Noun	0.70	0.19	0.56	0.53	0.31	0.18	0.69	0.36	0.58	0.37	0.71	0.34	0.65	0.37	0.60 (0.14)	0.33** (0.12)	0.01 (+)	0.00
Comprehension	Correct Response %	77	48	71	34	69	52	71	46	61	31	69	52	54	28	67.43 (7.57)	41.57*** (10.26)	-2.50	-0.20 (+)
	Incorrect Response %	4	7	4	19	0.00	27	0.00	25	4	4	4	0.00	7	20.	3.28 (2.50	14.57** (10.75)	-0.30	-0.60 (+)
	No Response %	19	45	25	47	31	21	29	29	35	65	27	48	39	52	29.29 (6.58)	43.86* (14.63)	2.20	0.80 (+)
	Judges' Assessment %	89.50	42.00***					67.00	50.50***					80.50 (10.50)	55.00*** 10.00)	79.00 (7.50)	49.17*** (12.40)	-1.50	2.17 (+)

Legend: * p .05 ** p .01 *** p .001 (one-tailed)
N = Native
F = Foreigner

Appendix G: (cont'd) - Monthly Records for children's linguistic and comprehension parameters: Means, (Standard Deviation) and Rate of Development for N & F in age-pair 3.

	Child Speech Parameters	February 35 month		March 36 month		April 37 month		May 38 month		June 39 month		Means (S.D.)		Rate of Development (+ Faster)	
		N	F	N	F	N	F	N	F	N	F	N	F	N	F
Language Ability	Mean Length of Utterance	3.56	2.30	3.30	2.30	3.46	2.80	3.96	2.96	3.60	3.10	3.58 (0.24)	2.69** (0.37)	0.12	0.24 (+)
	Verb/Utterance	0.66	0.46	0.32	0.24	0.30	0.36	0.44	0.50	0.62	0.50	0.47 (0.17)	0.41 (0.11)	0.01	0.05 (+)
	Noun/Utterance	0.78	0.58	0.62	0.62	0.68	0.44	0.66	0.58	0.22	0.38	0.59 (0.22)	0.52 (0.11)	-0.09	-0.04 (+)
	Pronoun/ Utterance	0.42	0.20	0.34	0.16	0.22	0.26	0.40	0.36	0.70	0.48	0.42 (0.18)	0.29 (0.13)	0.06	0.08 (+)
	Copula/Utterance	0.11	0.00	0.18	0.06	0.30	0.14	0.26	0.08	0.16	0.08	0.20 (0.08)	0.27** (0.05)	0.02	0.02
	Total/Utterance	1.97	1.24	1.46	1.08	1.50	1.20	1.76	1.52	1.70	1.44	1.68 (0.21)	1.30** (0.18)	0.01	0.11 (+)
	Auxiliary/Verb	0.36	0.08	0.62	0.41	0.46	0.55	0.50	0.36	0.38	0.16	0.46 (0.10)	0.31 (0.19)	-0.02	0.01 (+)
	Inflection/Verb	0.09	0.04	0.37	0.33	0.26	0.27	0.27	0.32	0.12	0.16	0.22 (0.12)	0.22 (0.12)	-0.01	0.02 (+)
	Inflection/Noun	0.00	0.00	0.25	0.09	0.11	0.13	0.24	0.10	0.20	0.15	0.17 (0.11)	0.09 (0.06)	0.03	0.03
	Total/Verb, Noun	0.45	0.12	1.24	0.83	0.83	0.95	1.01	0.78	0.70	0.47	0.85 (0.30)	0.63 (0.34)	0.00	0.05 (+)
Comprehension	Correct Response %	100	60	66	42	58	50	60	55	78	24	72.40 (17.29)	46.20* (14.08)	-4.67	-3.83 (+)
	Incorrect Response %	0.00	0.00	10	20	10	27	0.00	13	0.00	19	4.00 (5.48)	15.60* (10.06)	-1.67 (+)	1.83
	No Response %	0.00	40	24	38	32	23	40	32	22	58	23.60 (14.99)	38.20 (12.89)	6.33	2.00 (+)
	Judges' Assessment %	92.50 (7.80)	69.00*** (8.50)			77.00 (10.80)	66.50*** (12.70)			72.50 (10.70)	70.00 (11.70)	80.70 (8.20)	68.50*** (8.70)	-5.00	-0.20 (+)

Legend: * p .05 ** p .01 *** p .001 (one-tailed)
N = Native
F = Foreigner

Appendix G: (cont'd) - Monthly Records for children's linguistic and comprehension parameters: Means, (Standard Deviation) and Rate of Development for N & F in age-pair 5.

	Child Speech Parameters	December 66 month		January 67 month		February 68 month		March 69 month		April 70 month		May 71 month		June 72 month		Means (S.D.)		Rate of Development (+ Faster)	
		N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F
Language Ability	Mean Length of Utterance	4.86	2.66	6.62	4.46	6.20	3.60	4.46	3.46	4.88	3.80	6.28	4.10	6.84	4.96	5.73 (0.97)	3.86*** (0.74)	0.16	0.19 (+)
	Verb/Utterance	0.40	0.28	0.78	0.64	0.68	0.42	0.40	0.32	0.56	0.46	0.52	0.42	0.94	0.68	0.61 (0.20)	0.46 (0.15)	0.03 (+)	0.02
	Noun/Utterance	0.76	0.36	1.02	0.56	0.90	0.36	0.94	0.60	0.88	0.70	0.80	0.64	0.80	0.66	0.87 (0.09)	0.55*** (0.14)	-0.02	0.04 (+)
	Pronoun/ Utterance	0.46	0.30	0.64	0.60	0.62	0.52	0.30	0.28	0.56	0.44	0.70	0.42	0.92	0.64	0.60 (0.19)	0.46 (0.14)	0.05 (+)	0.02
	Copula/Utterance	0.12	0.10	0.12	0.10	0.12	0.10	0.16	0.08	0.28	0.02	0.18	0.16	0.08	0.00	0.15 (0.07)	0.08* (0.05)	0.00	0.00
	Total/Utterance	1.74	1.04	2.56	1.90	2.32	1.40	1.80	1.28	2.28	1.62	2.20	1.64	2.74	1.98	2.23 (0.37)	1.55** (0.34)	0.06	0.07 (+)
	Auxiliary/Verb	0.55	0.21	0.33	0.18	0.32	0.19	0.45	0.37	0.39	0.26	0.19	0.23	0.40	0.11	0.38 (0.11)	0.22** (0.08)	-0.03	-0.01 (+)
	Inflection/Verb	0.25	0.07	0.61	0.28	0.29	0.09	0.30	0.12	0.10	0.04	0.26	0.14	0.46	0.38	0.32 (0.16)	0.16 (0.12)	-0.01	0.02 (+)
	Inflection/Noun	0.26	0.00	0.19	0.03	0.26	0.25	0.21	0.00	0.27	0.17	0.47	0.21	0.15	0.24	0.25 (0.10)	0.10** (0.10)	0.02	0.04 (+)
	Total/Verb, Noun	1.06	0.28	1.13	0.49	0.87	0.33	0.96	0.49	0.76	0.47	0.92	0.58	1.01	0.73	0.96 (0.12)	0.48*** (0.15)	-0.03	0.05 (+)
Comprehension	Correct Response %	82	31	84	59	76	63	79	68	75	47	82	54	83	66	80.14 (3.53)	55.43*** (12.97)	-0.17	3.00 (+)
	Incorrect Response %	3	3	5	25	0.00	17	3	10	0.00	25	3	3	0.00	2	2.00 (2.00)	12.14* (10.24)	-0.50	-2.30 (+)
	No Response %	15	66	11	16	24	20	18	22	25	28	15	43	17	32	17.86 (5.05)	32.43* (17.28)	0.60	-0.70 (+)
	Judges' Assessment %	89.50 (5.10)	45.00*** (17.60)					88.00 (8.90)	85.00 (12.30)					93.00 (4.70)	76.00*** (13.10)	90.20 (4.40)	68.70*** (11.70)	0.58	5.17 (+)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed)
N = Native
F = Foreigner

Appendix H: Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 2 (26 to 32 months).

	Adult Speech Parameters	26 month AN	26 month AF	27 month AN	27 month AF	28 month AN	28 month AF	29 month AN	29 month AF	30 month AN	30 month AF	31 month AN	31 month AF	32 month AN	32 month AF	Means (S.D) AN	Means (S.D) AF
Overall	Mean Length of Utterance	4.92	4.90	6.00	6.14	4.84	4.74	5.56	5.80	5.66	5.52	5.50	5.92	6.60	6.60	5.58 (0.61)	5.66 (0.66)
	Mean Number of Utterances/turn	1.47	1.72	2.08	1.56	1.72	1.72	2.08	1.92	2.17	1.92	1.92	1.72	2.56	2.04	2.00 (0.35)	1.80* (0.16)
	C. Sentence	90	96	88	90	82	76	80	82	80	88	78	88	86	86	83.43 (4.58)	86.57 (6.29)
	Fragment	8	2	12	8	18	14	8	8	12	4	12	8	10	12	11.43 (3.40)	8.00* (4.16)
	Interjection	2	2	0.00	2	0.00	10	12	10	8	8	10	4	4	2	5.14 (4.87)	5.43 (3.78)
Surface Sentence Type	Declarative (Total)	26	40	50	36	30	30	32	32	30	34	32	44	48	36	35.43 (9.50)	36.00 (4.76)
	Declarative	16	24	14	20	16	12	24	18	24	28	20	20	32	32	20.86 (6.31)	22.00 (6.63)
	Deictic	10	16	32	16	10	16	8	12	6	6	12	22	12	4	12.86 (8.71)	13.14 (6.31)
	Fragment Declarative	0.00	0.00	4	0.00	4	2	0.00	2	0.00	0.00	0.00	2	4	0.00	1.71 (2.13)	0.86 (1.07)
	Imperative (Total)	6	16	22	24	22	20	34	20	16	16	14	26	8	4	17.13 (9.97)	18.00 (7.21)
	+ Imperative	0.00	8	16	16	12	10	20	18	12	12	14	16	8	4	11.71 (6.37)	12.00 (5.03)
	- Imperative	2	0.00	0.00	0.00	0.00	0.00	2	0.00	0.00	4	0.00	2	0.00	0.00	0.57 (0.98)	0.86 (1.57)
	Imperative + Subject	4	8	6	8	8	4	8	2	2	0.00	0.00	4	0.00	0.00	4.00 (3.46)	3.71 (3.35)
	Fragment Imperative	0.00	0.00	0.00	0.00	2	6	4	0.00	2	0.00	0.00	4	0.00	0.00	1.14 (1.57)	1.43 (2.51)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: (cont'd) - Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 2 (26 to 32 months).

Adult Speech Parameters		26 month AN	26 month AF	27 month AN	27 month AF	28 month AN	28 month AF	29 month AN	29 month AF	30 month AN	30 month AF	31 month AN	31 month AF	32 month AN	32 month AF	Means (S.D.) AN	Means (S.D.) AF
Surface Sentence Type	Questions (Total)	66	42	28	38	48	40	22	38	46	42	44	26	40	58	42.00 (14.33)	40.57 (9.43)
	Wh-question	28	18	2	12	8	10	2	4	10	12	8	4	10	20	9.71 (8.75)	11.43 (6.19)
	Wh-final	6	0.00	0.00	0.00	2	0.00	0.00	0.00	0.00	0.00	0.00	2	0.00	2	1.14 (2.27)	0.57 (0.98)
	Aux. yes/no	14	8	12	8	14	6	6	16	14	14	10	12	12	10	11.71 (2.93)	10.57 (3.60)
	Raised Verb	0.00	4	0.00	0.00	0.00	6	2	0.00	2	0.00	0.00	2	2	0.00	0.86 (1.07)	1.71 (2.43)
	Raised Intonation	8	8	4	10	10	12	8	10	8	6	10	4	6	8	7.71 (2.13)	8.29 (2.69)
	Declarative + Tag	2	0.00	2	0.00	0.00	0.00	0.00	2	0.00	0.00	2	0.00	2	6	1.14 (1.07)	1.14 (2.27)
	Tag	0.00	2	0.00	0.00	2	0.00	0.00	0.00	2	6	2	0.00	2	2	1.14 (1.07)	1.43 (2.23)
	Fragment Question	8	2	8	8	12	6	4	6	10	4	12	2	6	10	8.57 (2.99)	5.43 (2.99)
Complexity	Present	64	84	76	82	60	70	64	66	66	64	64	78	66	56	65.71 (4.96)	71.43 (10.31)
	Past	12	4	2	0.00	14	0.00	2	4	4	8	2	4	12	16	6.86 (5.52)	5.14 (5.52)
	Future	14	8	10	8	8	6	14	12	10	16	12	6	8	14	10.86 (2.54)	10.00 (4.00)
	Verbless Utterance	10	4	12	10	18	24	20	18	20	12	22	12	14	14	16.57 (4.58)	13.43 (6.29)
	Multiproposition	0.00	2	4	4	2	6	8	8	16	14	10	12	16	12	8.00 (6.43)	8.29 (4.54)
	S/node/sentence	1.00	1.02	1.05	1.04	1.02	1.08	1.10	1.10	1.20	1.16	1.13	1.14	1.19	1.14	1.10 (0.08)	1.10 (0.05)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: (cont'd) - Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 2 (26 to 32 months).

	Adult Speech Parameters	26 month AN	26 month AF	27 month AN	27 month AF	28 month AN	28 month AF	29 month AN	29 month AF	30 month AN	30 month AF	31 month AN	31 month AF	32 month AN	32 month AF	Means (S.D.) AN	Means (S.D.) AF
Discourse Features	Imitation (Total)	16	4	14	12	14	8	4	2	10	6	12	0.00	8	6	11.14 (4.14)	5.43** (3.95)
	Imitation	8	2	2	2	6	0.00	0.00	0.00	4	2	0.00	0.00	4	4	3.43 (2.99)	1.43 (1.51)
	Transformed Imitation	8	2	12	10	8	8	4	2	6	4	12	0.00	4	2	7.71 (3.35)	4.00* (3.65)
	Correction (Total)	6	6	6	6	0.00	2	6	16	4	0.00	6	8	2	8	4.29 (2.43)	6.57 (5.13)
	Syntactic	4	4	0.00	4	0.00	0.00	6	4	0.00	0.00	0.00	2	0.00	0.00	1.43 (2.50)	2.00 (2.00)
	Semantic	2	2	6	2	0.00	2	0.00	6	4	0.00	2	4	0.00	6	2.00 (2.31)	3.14 (2.27)
	Rephrase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6	0.00	0.00	4	2	2	2	0.86 (1.57)	1.43 (2.25)
	Repetition (Total)	14	32	20	40	20	28	28	28	16	48	12	38	22	34	18.86 (5.40)	35.43** (7.18)
	Repetition	4	22	10	22	12	6	10	8	6	18	2	16	8	8	7.43 (3.60)	14.29* (6.87)
	Transformed Repetition	4	2	6	6	0.00	8	10	14	4	20	2	8	10	10	5.14 (3.80)	9.71* (5.82)
	Paraphrase	6	8	4	12	8	14	8	6	6	10	8	14	4	16	6.29 (1.80)	11.43* (3.60)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 3 (35 to 39 months).

	Adult Speech Parameters	35 month AN	35 month AF	36 month AN	36 month AF	37 month AN	37 month AF	38 month AN	38 month AF	39 month AN	39 month AF	Means (S.D.) AN	Means (S.D.) AF
Overall	Mean Length of Utterance	5.08	4.82	4.88	4.98	4.74	4.80	5.20	5.22	5.80	5.62	5.14 (0.41)	5.09 (0.34)
	Mean Number of Utterances/turn	2.22	1.39	1.79	1.56	1.61	1.67	3.33	1.61	2.17	1.52	2.22 (0.67)	1.55* (0.11)
	C. Sentence	84	80	76	74	86	78	84	86	84	84	82.80 (3.90)	80.40 (4.77)
	Fragment	12	16	14	18	8	12	6	8	4	10	8.80 (4.15)	12.80** (4.15)
	Interjection	4	4	10	8	6	10	10	6	12	6	8.40 (3.29)	6.80 (2.28)
Surface Sentence Type	Declarative (Total)	48	22	14	14	22	24	46	16	32	18	32.40 (14.79)	18.80 (4.15)
	Declarative	36	8	12	10	10	8	42	12	22	12	24.40 (14.24)	10.00* (2.00)
	Deictic	2	4	0.00	0.00	10	12	2	0.00	10	0.00	4.80 (4.82)	3.20 (5.22)
	Fragment Declarative	10	10	2	4	2	4	2	4	0.00	6	3.20 (3.90)	5.60* (2.61)
	Imperative (Total)	6	2	14	2	20	10	4	4	22	14	13.20 (8.07)	6.40* (5.37)
	+ Imperative	4	2	10	2	10	8	0.00	4	12	10	7.20 (5.02)	5.20 (3.63)
	- Imperative	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40 (0.89)	0.00
	Imperative + Subject	0.00	0.00	2	0.00	10	2	2	0.00	8	4	4.40 (4.34)	1.20* (1.79)
	Fragment Imperative	0.00	0.00	2	0.00	0.00	0.00	2	0.00	2	0.00	1.20 (1.01)	0.00*

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: (cont'd) - Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 3 (35 to 39 months).

	Adult Speech Parameters	35 month AN	35 month AF	36 month AN	36 month AF	37 month AN	37 month AF	38 month AN	38 month AF	39 month AN	39 month AF	Means (S.D.) AN	Means (S.D.) AF
Surface Sentence Type	Questions (Total)	42	72	62	76	52	56	40	74	34	62	46.00 (11.05)	68.00** (8.60)
	Wh-question	22	52	22	24	20	20	12	24	12	26	17.60 (5.18)	29.20* (12.93)
	Wh-final	0.00	0.00	0.00	0.00	0.00	0.00	2	0.00	0.00	0.00	0.40 (0.89)	0.00
	Aux. Yes/no	10	12	20	26	12	16	12	24	14	24	13.60 (3.85)	20.40* (6.07)
	Raised Verb	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40 (0.89)	0.00
	Raised Intonation	2	0.00	0.00	6	4	6	2	0.00	4	0.00	2.40 (1.67)	2.40 (3.29)
	Declarative + Tag	4	0.00	4	4	6	2	6	4	0.00	4	4.00 (2.45)	12.80 (1.79)
	Tag	0.00	2	6	2	4	4	4	18	2	4	3.20 (2.28)	6.00 (6.78)
	Fragment Question	2	6	10	14	6	8	2	4	2	4	4.40 (3.58)	7.20** (4.45)
Complexity	Present	82	80	68	72	82	74	76	52	80	70	77.60 (5.90)	69.60 (10.53)
	Past	2	0.00	4	0.00	0.00	2	4	30	0.00	0.00	2.00 (2.00)	6.40 (13.22)
	Future	0.00	0.00	4	2	4	2	4	4	4	14	3.20 (1.79)	4.40 (5.55)
	Verbless Utterance	16	20	24	26	14	22	16	14	16	16	17.20 (3.90)	19.60 (4.77)
	Multiproposition	10	8	12	8	6	16	10	6	18	16	11.20 (4.38)	10.80 (4.82)
	S/node/sentence	1.12	1.10	1.16	1.11	1.07	1.21	1.12	1.07	1.21	1.19	1.14 (0.05)	1.14 (0.06)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: (cont'd) - Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 3 (35 to 39 months).

	Adult Speech Parameters	35 month AN	35 month AF	36 month AN	36 month AF	37 month AN	37 month AF	38 month AN	38 month AF	39 month AN	39 month AF	Means (S.D.) AN	Means (S.D.) AF
Discourse Features	Imitation (Total)	12	10	4	12	2	6	2	4	2	4	4.40 (4.34)	7.20 (3.63)
	Imitation	6	6	2	6	2	2	2	4	2	4	2.80 (1.79)	4.40* (1.67)
	Transformed Imitation	6	4	2	6	0.00	4	0.00	0.00	0.00	0.00	1.60 (2.61)	2.80 (2.68)
	Correction (Total)	8	8	0.00	4	14	12	4	4	0.00	6	5.20 (5.93)	6.80 (3.35)
	Syntactic	0.00	2	0.00	0.00	0.00	4	0.00	0.00	0.00	0.00	0.00	1.20 (1.79)
	Semantic	4	6	0.00	4	12	8	4	4	0.00	2	4.00 (4.90)	4.80 (2.28)
	Rephrase	4	0.00	0.00	0.00	2	0.00	0.00	0.00	0.00	4	1.20 (1.79)	0.80 (1.79)
	Repetition (Total)	20	32	18	24	20	24	12	18	16	36	17.20 (3.35)	26.80* (7.16)
	Repetition	2	8	4	4	2	8	6	6	2	14	3.20 (1.79)	8.00* (3.75)
	Transformed Repetition	12	14	8	10	14	10	0.00	4	8	10	8.40 (5.37)	9.60 (3.58)
	Paraphrase	6	10	6	10	4	6	6	8	6	12	5.60 (0.89)	9.20** (2.28)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 5 (66 to 72 months).

	Adult Speech Parameters	66 month AN	66 month AF	67 month AN	67 month AF	68 month AN	68 month AF	69 month AN	69 month AF	70 month AN	70 month AF	71 month AN	71 month AF	72 month AN	72 month AF	Means (S.D.) AN	Means (S.D.) AF
Overall	Mean Length of Utterance	6.16	6.73	5.06	5.30	5.77	5.60	6.19	6.10	6.03	6.84	5.15	5.38	5.06	5.65	5.63 (0.53)	5.80 (0.80)
	Mean Number of Utterances/turn	2.04	1.61	2.63	1.56	2.63	1.85	2.90	2.50	3.13	1.56	2.50	1.85	2.13	1.92	2.57 (0.39)	1.84** (0.33)
	C. Sentence	74	90	76	68	72	63	79	81	82	79	56	64	73	68	73.14 (8.33)	73.29 (10.16)
	Fragment	14	4	12	18	15	26	13	8	11	16	31	23	15	18	15.86 (6.84)	16.14 (7.80)
	Interjection	12	6	12	14	13	11	8	11	7	5	13	13	12	14	11.00 (2.45)	10.57 (3.69)
Surface Sentence Type	Declarative (Total)	28	27	26	22	39	27	53	41	56	27	32	20	29	17	37.57 (12.31)	25.86** (7.76)
	Declarative	14	18	16	14	21	13	20	21	25	17	9	8	13	4	16.86 (5.46)	13.57 (5.91)
	Deictic	5	8	2	6	9	7	20	13	23	3	5	4	8	5	10.29 (8.03)	6.57 (3.30)
	Fragment Declarative	9	1	8	2	9	7	13	7	8	7	18	8	8	8	10.43 (3.78)	5.71** (2.93
	Imperative (Total)	1	2	0.00	2	3	1	4	4	3	0.00	2	1	3	0.00	2.29 (1.38)	1.43 (1.40)
	+ Imperative	1	1	0.00	2	2	1	2	1	3	0.00	1	1	0.00	0.00	1.29 (1.11)	0.86 (0.69)
	- Imperative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Imperative + Subject	0.00	1	0.00	0.00	1	0.00	2	3	0.00	0.00	1	0.00	3	0.00	1.00 (1.15)	0.57 (1.13)
	Fragment Imperative	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: (cont'd) - Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 5 (66 to 72 months).

Adult Speech Parameters		66 month AN	66 month AF	67 month AN	67 month AF	68 month AN	68 month AF	69 month AN	69 month AF	70 month AN	70 month AF	71 month AN	71 month AF	72 month AN	72 month AF	Means (S.D.) AN	Means (S.D.) AF
	Questions (Total)	59	65	62	62	45	61	35	44	34	68	53	66	56	69	49.14 (11.33)	62.14** (8.51)
Surface Sentence Type	Wh-question	19	20	12	10	7	13	10	14	13	20	7	11	10	17	11.14 (4.14)	15.00* (4.08)
	Wh-final	0.00	0.00	0.00	0.00	0.00	1	0.00	1	0.00	0.00	1	1	0.00	0.00	0.14 (0.38)	0.43 (0.53)
	Aux. yes/no	20	33	24	12	18	17	12	15	4	24	16	27	12	18	15.14 (6.52)	20.86 (7.43)
	Raised Verb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Raised Intonation	8	4	8	10	3	6	6	8	10	11	5	7	8	6	6.86 (2.34)	7.43 (2.44)
	Declarative + Tag	6	3	4	12	4	4	3	3	4	3	6	1	10	8	5.29 (2.36)	4.86 (3.80)
	Tag	1	2	10	2	7	1	4	2	0.00	1	5	4	9	10	5.14 (3.80)	3.14 (3.18)
	Fragment Question	5	3	4	16	6	19	0.00	1	3	9	13	15	7	10	5.43 (4.04)	10.43* (6.73)
Complexity	Present	53	73	76	64	52	53	77	77	81	40	28	27	58	42	60.71 (18.81)	53.71 (18.53)
	Past	7	10	0.00	4	19	10	2	4	1	38	28	37	11	26	9.71 (10.48)	18.42 (14.97)
	Future	14	7	0.00	0.00	1	0.00	0.00	0.00	0.00	1	0.00	0.00	4	0.00	2.71 (5.19)	1.14 (2.61)
	Verbless Utterance	26	10	24	32	28	37	21	19	18	21	44	36	27	32	26.86 (8.34)	26.71 (10.16)
	Multiproposition	5	10	8	8	10	9	13	12	11	13	8	13	10	9	9.29 (2.56)	10.57 (2.07)
	S/node/sentence	1.07	1.11	1.11	1.12	1.14	1.14	1.17	1.15	1.13	1.17	1.14	1.20	1.14	1.13	1.13 (0.03)	1.15 (0.03)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix H: (cont'd) - Monthly scores, means, (standard deviation) and significance for adult speech to native (AN) and foreigner (AF) for age-pair 5 (66 to 72 months).

	Adult Speech Parameters	66 month AN	66 month AF	67 month AN	67 month AF	68 month AN	68 month AF	69 month AN	69 month AF	70 month AN	70 month AF	71 month AN	71 month AF	72 month AN	72 month AF	Means (S.D.) AN	Means (S.D.) AF
Discourse Features	Imitation (Total)	14	6	16	8	13	11	19	9	9	6	16	15	7	8	13.43 (4.20)	9.00* (3.16)
	Imitation	11	5	8	6	9	10	17	9	9	5	16	13	6	6	10.86 (4.14)	7.71* (3.04)
	Transformed Imitation	3	1	8	2	4	1	2	0.00	0.00	1	0.00	2	1	2	2.57 (2.82)	1.29 (0.76)
	Correction (Total)	5	4	2	14	3	10	4	6	3	7	6	7	0.00	4	3.29 (1.98)	7.43* (3.55)
	Syntactic	0.00	0.00	0.00	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29 (0.76)
	Semantic	2	1	0.00	2	0.00	0.00	1	2	3	2	1	1	0.00	2	1.00 (1.15)	1.43 (0.79)
	Rephrase	3	3	2	10	3	10	3	4	0.00	5	5	6	0.00	2	2.29 (1.80)	5.71* (3.20)
	Repetition (Total)	28	58	18	12	18	18	9	24	9	33	12	24	6	20	14.29 (7.59)	27.00* (15.11)
	Repetition	3	13	8	0.00	1	1	3	2	4	3	1	1	3	3	3.29 (2.36)	3.29 (4.42)
	Transformed Repetition	11	25	10	4	9	9	0.00	11	2	24	7	13	1	8	5.71 (4.61)	13.43* (8.06)
	Paraphrase	14	20	0.00	8	8	8	6	11	3	6	4	10	2	9	5.29 (4.64)	10.29** (4.57)

Legend: * $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed test)

Appendix I: Identification of speech function.

The following are transcripts of adults talking to children or to other adults. The speech of the adult we are interested in is always in the left-hand column. In the right-hand column is the speech of any other participant: F and N (children) or E, T_1, T_2 etc. (adults). Please mark the left column according to the following instructions:

Mark 1 segments of speech where the speaker is mainly interested in relating information to both or either of his listeners and dominates the conversation in order to do so.

Mark 2 segments of speech where the speaker is mainly interested in the contribution of both or either of his listeners and speaks largely in response to them.

Please put your labels in the column provided indicating how much speech they refer to by running arrows along the label column or by circling the area in question. A labeled example follows.

THANK YOU

Label	Adult	Participants
		N:That's my daddy.
2	Is it?	
	What do you want me to do with it N?	
		N:Take the hat off.
	That's his hair; it's not his hat.	
	Can't take its hair off.	
		N:That's my daddy.
1	Do you know where Ian's gone just now? He's gone to London on the plane this morning, and all last week.	
		F:Look N. Look.
	What is it?	
		F:Can't see it.
2	Can't see what?	
		F:That.
	What?	
		F:There.
	Show me.	
	The plane?	
	oh I see yeah.	
		N:a big window. a big window.
	I took Nicola to the bank with me today to get some money and she was saying.	N:Window. I got window.
1	She was telling me about going to Jersey on her holidays.	

Label	Adult One	Participants
		E: D'you smoke?
	No I don't smoke, thanks.	
		E: Aren't you lucky?
	A cup of coffee?	
		E: Hm?
		E: oh all right. Have I taken your place?
	No it's all right. Here; come and sit here; I'll go and.. what d'you take? milk and sugar?	
		E: Please, thanks.
	Doesn't matter how nice the boss is, if it's, she's there it's never....	
		T: It's a boss?
	Yes. (laughter)	
	--------?----------	T: That is name's father.
		E: oh, thanks very much.
		T: That's all the sort of information we have.
		E: There's nothing like nationality?
		T: No, em, I'm sure.
	Right how many sugar?	
		E: one and a half please.
	We can ask the father easily enough, easy enough tonight when he comes.	
		T: He's very nice you know.
	Sorry, it's just an ashtray. Yes, he is; isn't he? He really is nice.	
		T: Yes, he's nice, yes, hm.
		E: oh the sun, at last.
	Well that is the best time of the day, just 3 o'clock because everything's be done, I hope to quieten them down a bit you know; it's almost the end of the day and this is the first break again. The boss is here at dinner time and tea-break in the morning; and this is the first time I really feel it is a break..... The rest of the day I always feel as if I should be doing something em never, I never do; I just sit here and feel guilty about it, you know. (laughter)	
		E: Horrid weather.
	It is isn't it? So cold as well.	
		T: You'll really feel it too

Label	Adult Two	Participants
	yes;	
		T: .....?.....
	I think so: aha: that'ld be nice eh?	
		T: That's right.
		T: Where did you put my cigarettes?
	over in the cupboard; on the top shelf.	
		T: I'll nip out later..
	aha right.	
		T: Judith's been by today.
	which way? along towards the flat?	
		T: I bet they're not going where they should be.
	chances eh?	
	Whereabout does she come from?	
		T: I forget. She did tell me.. I cannae remember
	She lived just along the road? in a flat?	T: aye
		T: .....?.....
		T: I think my pocket's gonna be bulging.
	Leave them here, leave them here; okey?	
	They're up there all right?	
		T: Now d'you want me to pass them around?
	.....?.....	
	Vocative do you want a glass of milk?	
		T: I'm not fussy
	Right We'll get a wee drop.	
	Do you want that one?	
		T: I'll take this one.
	Have you got a wee one?	
		T: I've got a wee one aye
	That's carnation milk	
		E: There's another class
	a bigger one for 18 children upstairs. It's mixed as well. Bit they're more older ones upstairs, you know. We've got one 2 year old up the stairs.	

Label	Adult Two	Participants
		E: One and two years old
	No just one 2 year old	
		E: One, ah one 2 year old... I suppose you enjoy working with children.
	oh yeah. I would never be able to work in an office. I like the freedom with this sort of job because you're more or less.. it's up to you what you do. In the summer it's fantastic y'know, you can go for walks or go to the beach and you're out in the fresh air all the time. It's really great. We go for picnics and things like that you know it's great. I don't thinck you could ever get into.. a routine yeah.	
		E: a routine
		E: I enjoy working with kids too.
	aha there's an awful lot more of job satisfaction as well when you work with children I think.	
		E: oh yes you see them grow up.
	yes it's nice, and you see them when they first come in it's great; when you see them may be a year later and you think' oh have I made that change in them 1' Or when they go to school and they come back to see you, you say oh...	
		E: yes it's nice.... And who's the oldest I mean the oldest age.
	In this room or upstairs so well?	
		E: Upstairs, in the whole place.
	I think Colin'll be the oldest. He's five already and Michael's five already. You know they're going to school after the summer holidays and they've been here well..Michael's been since he was two. He's been here for three years.	

Label	Adult Three	Participants
		T_1:D'you want it now?
	What would you like?	
		T_1:I'll give it to you now.
	Well if it's allright.	
		T_1:How much?
	eh, em, one fifty two, I think	
		T_1:Are you sure?
	yes. Let me see... There's, there's, there's eh Catherine, Doreen and Kate, myself and you and Isabel.... and I'll ask Mrs (name).	
		T_1:and Anna.
	There's Anna; So what will that be? That'll be, eight..	
		T_1:one twenty nine.
	Well, well, will we make it twenty?	
		T_1:make it twenty.
	Make it twenty will I? And I've got a very good friend who's got this flower shop you see.. otherwise.. Have you had a thought about it?	
		T_1:Right.
		T_1:That's yours; as far down as you get.
	w,w,what..	
		$T_2$is it here yet?
	No I' ve never seen it. Right dear.	
		T_1:well
	What is it?	
		T_1:instead of..
	I can get it tomorrow.	
		T_1:no, it's not that. I'm going home in the buss and I'm meeting Fionna and I need...
	oh and you want your change?	
		T_1:See bus fares, it's, it's scream
	How much d'you pay?	

Label	Adult Three	Participants
	Mrs (Adult 3) was in the Navy Mrs E.	
		E: Really?
	during the war.	
		E: oh you'll tell me about this sometime.
	It's a long time ago. I was in the, what we call the Wrens. That's the Women's Royal Naval Service and I trained as an engineer, and I worked on aircrafts and aeroplanes.. during the war, and I had to strip down the engines and build them up and repair them, and as they came back and they were all full of bullets and things like that I had to repair them and all that and eh, em- But it was the Fleet Air Arms, you see, that was the, that was like the Air Force bit of the Navy. And I thoroughly enjoyed it. Because I'd been to university first and I did Maths at university, and then I, and then I went and did eh didn't finish, didn't quite finish then at university, and then I went into the Wrens. I was in there for three years and I worked on aircraft and air rooms you know.	E: oh 1
		E: oh very good
	But the Navy's a good life for a young man because I feel they get.... It's a, it's a good open life but they still get discipline and they get great opportunities because if a boy shows eh shows that he has opportuni has the ability, I mean, they'll send him to university and things like that.	
		E: That's super.

Label	Teacher one	Participants
	We were very lucky. We were lucky because Santa came to visit us yesterday at our party. And we sang some of our songs for .. we sang.. (Santa got stuck up the chimney)	
		F: I not crying
	Do you think you'll get stuck up in the chimney N? ...	
		N: yeah
	Where did Santa come in? Through the chimney? .. but look ... Santa's stuck up in that chimney up there isn't he? ..	
		N and F: yeah
	He's got a lovely white curly beard look and a white moustache and blue eyes .. and a lovely red coat. Whose got a red jumper on?	N: me, me
	I can see somebody with a red jumper.	N: I got jumper on
		F: I a r on
	and red trousers and red boots. and look the Xmas tree is green... Whose got a green jumper? F's got a green jumper; F's got a green jumper. The same colour as the Xmas tree isn't it? And I got a green hat on. And look this is a green ball from the Xmas tree.. that one is broken.	
		N: I found it
	Let's go for a walk.	
		F: No
	Ready let's go. I can see a great big mountain over there. Shall we go and climb it?	
		N: yes
		F: yeah
	To get to that mountain you've got to go through lots and lots of different fields. So once you cross the road and the first field we come to has got long long grass, and we can't get through that grass unless we go swish, swish.	
		F and N: swish, swish
	Push it back swish	
		N: We can't walk. we can't walk in it.

Label	Teacher One	Participants
	Yeah we can walk, but we've got to push all the grass back.	
	Right, we're at the end of the fields. Get all the grass off your clothes and stuff.. walk along. We come to a great big river, and the only way you can get across a river is to swim. So let's swim.. whish, whish	
		N: whish, whish
		F: No
	Alright let's jump out. Let's dry ourselves. All our hair's wet and all our clothes are wet. That's it; walk along. We're going to climb up the mountain; climb; stretch up hard because it's very tiring at the top.	
	Right you're going to get me some milk and some sugar?.. in my coffee	
		F: milk
		N: I make some potatoes
	Go and get me something to eat. I want some chicken and some potatoes and some sweet corn	
		F: sweet corn
	like we had for our dinner today.	
		N: I got you some
		N: here's one
	You've get me some? Thank you. That's it. F are you getting the pans out to make ss.. the tea?	
		F: I make
	The pots and the pans out.	
		N: Get pans out
	Watch his fingers N. Watch his fingers.	
		F: Here's coffee. Here's co
	Coffee? Is that coffee?	
		N: Gonna be hot
		F: It's hot
	It's hot?	
		F: Yes
	What is it?	
		F: Hot
	Hot what?	

Label	Teacher Two	Participants
	What's this animal called? in there?	
		N: Polar bear
	is it?	
		F: Polar bear
	not a polar bear.	
		F: Pan
	It's a panda.	
		F: Panda
		N: Panda
	yes good.	
		N: How's pandas at zoo?
	mm?	
		N: How's pandas at zoo?
	Well, it's an animal isn't it? People like to look at pandas don't they?	
		N: When I was at caravan I saw panda
	When you where?	
		N: at the caravan
	at the caravan? mm	
		F: I see panda at caravan
	did you?	
		F: yes
	and do you know what that notice there says?	
		F: yes
	Do you? ... You don't. It says 'Do not feed'. That means you've not to throw anything into the animals; because the zookeepers give then what they're supposed to eat. If people were allowed to throw things in they would start to throw in horrible sticky buns, and animals don't have toothbrushes do they? So all their teeth would go bad and they would have sore teeth and poor animals ! so that's why you've not to feed them... because they get enough to eat or they'ld get so fat.	N: when I was in the zoo

Label	Teacher Two	Participants
		N: parrots eat sultanas
	yes whum parrots do.	F: I eat something
	They can eat nuts can't they?	
		F: yes
	oh now look at this. There are lots and lots of monkeys there, aren't there? what's that one doing?	
		N: jumping
	yes it looks like it's jumping	
		F: he's going to fall
	because monkeys can jump from tree to tree can't they? And sometimes monkeys copy, what you're doing... I think I knew a story once about a man that went for a walk and he was in the woods... in the jungle it was where the monkeys are and he got tired.	F: yes
	So the monkeys were up in the tree, they were looking at him and he scratched his head like this, so all the monkeys did the same, and the man thought they're making fun of me. So then.. oh no it was a man who had lots and lots of hats on his head, a great big pile of hats about ten different hats on his head.	F: I got hat
	D'you think that was funny?	
		F: I got hat
	And I think the monkeys wanted the hats. They all took the hats from him and they were all copying him. So he didn't. They wouldn't give him the hats back. So he thought now they're all copying me so if I take off my hat and throw it away they'll all do the same. So he did. He took off his hat. etc.	

Label	Teacher Three	Participants
		size and his other leg this size.
	oh I see. He sounds like a funny man like you paint, didn't you F?	
		F: yes.
		N: and his big arms like this.
	oh I see	N: and a wee funny hat.
		F: And I do hat too.
	You do a hat? What kind of a hat? a top hat? a cowboy hat?	F: it's a.. like..a..
		F: it's down like that and I put...
	a witch's hat?	
		F: yes.
	with, got, it's got a point?.. I mean it goes like that?	
		F: yes.
	That's right. And th, th, those are the kind of hat you like?	
		F: yes, and my aunt get some.. a number and you have a bottle. And then every number we have. We see any number we going to put it but don't go over the line.. I just make them scrib
	oh I see.. So.. when you paint you keep in the lines don't you? otherwise it's not neat and it's just a scribble isn't it?	
		F: yes
	What does your wee brother like to play with?	
		F: Santa Clause give her hammer
	There's a bat and there's a ball, and the ball has a piece of elastic isn't that right?	
		F: yes
		N: and then..

Label	Teacher Three	Participants
	That's right, and and you can bounce it up and down or you can bounce it down the way or up the way; or you can bounce it sideways. You can do all sorts of tricks with it. And you can do it like a circle as well. You can do it like a circle. There's another thing that's round and it has string round it and goes up and down. D'you know what that's called?	
		F: a ball
	Well it's something like a ball but it's sort of flat and it's called a yoyo. Have you ever seen a yoyo?	
		F: I had one
		N: I've.. I used to have two, but one got lost
	oh my goodness! things do get lost with you young ladies don't they? I think Mr Nobody must come along and take them. So the yoyo you can wind that up and you can put that down. And you can throw it out to the side and make it go round in circles if you're very very clever. Some people are very clever they can make all sort of things with it. Well there we are.	

Appendix J: Monthly score, mean and (Standard Deviations) of AB (Type I) to age-pair 2 (26 to 32 months)+.

Adult Speech Parameters		27 month	28 month	31 month	32 month	Mean (S.D.)
Overall	Mean length of utterance	8.62	6.90	6.52	8.72	7.69 (1.14)
	Mean number of utterance/ turn	3.13	1.85	2.50	2.94	2.61 (0.57)
	Sentence	88	88	88	90	88.50 (1.00)
	Fragment	6	12	8	8	8.50 (2.52)
	Interjection	6	0.00	4	2	3.00 (2.58)
Surface Structure Type	Declarative (Total)	56	34	42	60	48.00 (12.11)
	Declarative	46	26	32	50	38.50 (11.36)
	Deictic	6	2	10	6	6.00 (3.27)
	Fragment Declarative	4	6	0.00	4	3.50 (2.52)
	Imperative (Total)	24	32	18	16	22.50 (7.19)
	+ Imperative	24	28	12	14	19.50 (7.72)
	- Imperative	0.00	0.00	0.00	0.00	0.00
	Imperative + Subject	0.00	2	2	0.00	1.00 (1.15)
	Fragment Imperative	0.00	2	4	2	2.00 (1.63)

Legend: + values for missing months not given due to insufficient material (less than 50 utterances).

Appendix J: (cont'd) - Monthly score, mean and (Standard Deviations) of AB (Type I) to age-pair (26 to 32 months)+.

Adult Speech Parameters		27 month	28 month	31 month	32 month	Mean (S.D.)
Surface Structure Type	Questions (Total)	14	34	36	22	26.50 (10.38)
	Wh-questions	6	14	12	4	9.00 (4.76)
	Wh-final	0.00	2	2	0.00	1.00 (1.15
	Aux. yes/no	2	6	14	10	8.00 (5.16)
	Raised Verb	0.00	6	0.00	0.00	1.50 (3.00)
	Raised Intonation	0.00	2	2	4	2.00 (1.63)
	Declarative + tag	4	0.00	2	2	2.00 (1.63)
	Tag	0.00	0.00	0.00	0.00	0.00
	Fragment Questions	2	4	4	2	3.00 (1.16)
Complexity	Present	74	66	68	72	70.00 (3.65)
	Past	12	2	0.00	8	5.50 (5.51)
	Future	2	20	20	10	13.00 (8.72)
	Verbless Utterance	12	12	12	10	11.50 (1.00)
	Multipropo-sition	14	14	14	36	19.50 (11.00)
	S/node/ sentence	1.16	1.16	1.16	1.40	1.22 (0.12)

Legend: + values for missing months not given due to insufficient material (less than 50 utterances).

Appendix J: (cont'd) - Monthly score, mean and (Standard Deviations) of AB (Type I) to age-pair (26 to 32 months)+.

Adult Speech Parameters		27 month	28 month	31 month	32 month	Mean (S.D.)
Discourse Features	Imitation (Total)	0.00	0.00	0.00	0.00	0.00
	Imitation	0.00	0.00	0.00	0.00	0.00
	Transformed Imitation	0.00	0.00	0.00	0.00	0.00
	Correction (Total)	0.00	0.00	0.00	0.00	0.00
	Syntactic	0.00	0.00	0.00	0.00	0.00
	Semantic	0.00	0.00	0.00	0.00	0.00
	Rephrase	0.00	0.00	0.00	0.00	0.00
	Repetition (Total)	22	46	34	46	37.00 (11.49)
	Repetition	6	24	16	4	12.50 (9.29)
	Transformed Repetition	6	6	2	6	5.00 (2.00)
	Paraphrase	10	16	16	36	19.50 (11.36)

Legend: + values for missing months not given due to insufficient material (less than 50 utterances)

Appendix J: Monthly score, mean and (Standard Deviations) of AB (Type I) to age-pair 3 (35 to 39 months)

Adult Speech Parameters		35 month	36 month	37 month	38 month	39 month	Mean (S.D.)
Overall	Mean length of utterance	6.26	7.86	6.40	8.42	7.86	7.36 (0.97)
	Mean number of utterance/ turn	2.17	2.63	2.17	4.17	3.33	2.89 (0.86)
	Sentence	88	94	96	92	98	93.60 (3.85)
	Fragment	10	4	0.00	6	2	4.40 (3.85)
	Interjection	2	2	4	2	0.00	2.00 (1.41)
Surface Structure Type	Declarative (Total)	62	46	28	62	60	51.60 (14.79)
	Declarative	48	42	18	54	46	41.60 (13.89)
	Deictic	4	2	10	4	12	6.40 (4.34)
	Fragment Declarative	10	2	0.00	4	2	3.60 (3.85)
	Imperative (Total)	2	22	28	10	4	13.20 (11.37)
	+ Imperative	2	20	24	8	4	11.60 (9.84)
	- Imperative	0.00	0.00	0.00	0.00	0.00	0.00
	Imperative + Subject	0.00	0.00	4	0.00	0.00	0.80 (1.79)
	Fragment Imperative	0.00	2	0.00	2	0.00	0.80 (1.10)

Appendix J: (cont'd) - Monthly score, mean and (Standard) Deviations) of AB (Type I)to age-pair 3 (35 to 39 months).

	Adult Speech Parameters	35 month	36 month	37 month	38 month	39 month	Mean (S.D.)
Surface Structure Type	Questions (Total)	34	30	40	26	36	33.20 (5.40)
	Wh-questions	28	10	26	8	16	17.60 (9.10)
	Wh-final	0.00	0.00	0.00	0.00	0.00	0.00
	Aux. yes/no	6	10	4	10	14	8.80 (3.90)
	Raised Verb	0.00	0.00	2	0.00	0.00	0.40 (0.89)
	Raised Intonation	0.00	0.00	0.00	0.00	2	0.40 (0.89)
	Declarative + tag	0.00	10	8	8	4	6.00 (4.00)
	Tag	0.00	0.00	0.00	0.00	0.00	0.00
	Fragment Question	0.00	0.00	0.00	0.00	0.00	0.00
Complexity	Present	84	78	88	80	82	82.40 (3.85)
	Past	0.00	4	0.00	10	4	3.60 (4.10)
	Future	4	12	8	2	12	7.60 (4.56)
	Verbless Utterances	12	6	4	8	2	6.40 (3.85)
	Multipropo-sition	28	16	12	32	22	22.00 (8.25)
	S/node/ sentence	1.32	1.17	1.13	1.35	1.22	1.24 (0.09)

Appendix J: (cont'd) - Monthly score, mean and (Standard Deviations) of AB (Type I) to age-pair 3 (35 to 39 months).

	Adult Speech Parameters	35 month	36 month	37 month	38 month	39 month	Mean (S.D.)
Discourse Features	Imitation (Total)	0.00	0.00	0.00	0.00	0.00	0.00
	Imitation	0.00	0.00	0.00	0.00	0.00	0.00
	Transformed Imitation	0.00	0.00	0.00	0.00	0.00	0.00
	Correction (Total)	0.00	0.00	0.00	0.00	0.00	0.00
	Syntactic	0.00	0.00	0.00	0.00	0.00	0.00
	Semantic	0.00	0.00	0.00	0.00	0.00	0.00
	Rephrase	0.00	0.00	0.00	0.00	0.00	0.00
	Repetition (Total)	22	32	24	38	20	27.20 (7.56)
	Repetition	8	12	10	8	8	9.20 (1.79)
	Transformed Repetition	6	2	0.00	2	0.00	2.00 (2.45)
	Paraphrase	8	18	14	28	12	16.00 (7.62)

Appendix J: Monthly score, mean and (Standard Deviation) of AB (Type I) to age-pair 5 (66 to 72 months)+.

	Adult Speech Parameters	67 month	68 month	69 month	70 month	71 month	72 month	Means (S.D.)
Overall	Mean length of utterance	10.30	9.47	9.79	9.39	8.56	9.84	9.56 (0.59)
	Mean number of utterance/ turn	3.57	3.13	6.67	4.55	2.78	3.45	4.03 (1.43)
	Sentence	98	88	93	94	98	89	93.33 (4.27)
	Fragment	0.00	4	3	4	2	9	3.67 (3.01)
	Interjection	2	8	4	2	0.00	2	3.00 (2.76)
Surfact Structure Type	Declarative (Total)	70	75	80	87	62	72	74.33 (8.59)
	Declarative	52	47	54	49	48	55	50.83 (3.31)
	Deictic	18	24	23	34	12	10	20.17 (8.82)
	Fragment Declarative	0.00	4	3	4	2	7	3.33 (2.34)
	Imperative (Total)	6	1	2	1	2	0.00	2.00 (2.09)
	+ Imperative	6	1	2	1	2	0.00	2.00 (2.09)
	- Imperative	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Imperative + Subject	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fragment Imperative	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Legend: + values for missing months not given due to insufficient material (less than 50 utterances)

Appendix J: (cont'd) - Monthly score, mean and (Standard Deviation) of AB (Type I) to age-pair 5 (66 to 72 months)+

Adult Speech Parameters		67 month	68 month	69 month	70 month	71 month	72 month	Means (S.D.)
Surface Structure Type	Questions (Total)	22	16	14	9	36	26	20.50 (9.67)
	Wh-question	0.00	1	2	2	10	11	4.33 (4.84)
	Wh-final	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Aux. yes/no	8	2	3	1	18	8	6.67 (6.31)
	Raised Verb	0.00	1	0.00	0.00	0.00	0.00	0.17 (0.41)
	Raised Intonation	4	2	2	0.00	2	0.00	1.67 (1.51)
	Declarative + tag	10	10	7	6	6	5	7.33 (2.16)
	Tag	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fragment Question	0.00	0.00	0.00	0.00	0.00	2	0.33 (0.82)
Complexity	Present	92	81	89	86	78	67	82.17 (9.02)
	Past	4	6	3	8	18	14	8.83 (5.95)
	Future	4	1	1	0.00	2	8	2.67 (2.94)
	Verbless Utterances	0.00	12	7	6	2	11	6.33 (4.76)
	Multipropo-sition	40	36	36	35	32	50	38.17 (6.33)
	S/node/ sentence	1.41	1.41	1.39	1.37	1.33	1.56	1.41 (0.08)

Legend: + values for missing months not given due to insufficient material (less than 50 utterances)

Appendix J: (cont'd) - Monthly score, mean and (Standard Deviation) of AB (Type I to age-pair 5 (66 to 72 months)+

Adult Speech Parameters		67 month	68 month	69 month	70 month	71 month	72 month	Means (S.D.)
Discourse Features	Imitation (Total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Imitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Transformed Imitation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Correction (Total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Syntax	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Semantic	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rephrase	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Repetition (Total)	40	30	37	31	32	30	33.33 (4.18)
	Repetition	8	8	12	6	8	8	8.33 (1.97)
	Transformed Repetition	14	9	13	5	10	12	10.50 (3.27)
	Paraphrase	18	13	12	20	14	10	14.50 (3.78)

Legend: + values for missing months not given due to insufficient material (less than 50 utterances)

Appendix K: Means, (Standard Deviation) and significance level of AB versus AN and AF, age-pair 2 (26-32 months).

Adult Speech Parameters		Means (S.D.)		
		AB	AN	AF
Overall	MLU	7.69	5.58**	5.66*
		(1.14)	(0.61)	(0.66)
	MUT	2.61	2.00*	1.80*
		(0.57)	(0.35)	(0.16)
	C. Sentence	88.50	83.43	86.57
		(1.00)	(4.58)	(6.29)
	Fragment	8.50	11.43**	8.00*
		(2.52)	(3.40)	(4.16)
	Interjection	3.00	5.14	5.43
		(2.58)	(4.87)	(3.78)
Surface Sentence Type	Declarative (Total)	48.00	35.43*	36.00
		(12.11)	(9.50)	(4.76)
	Declarative	38.50	20.86*	22.00**
		(11.36)	(6.31)	(6.63)
	Deictic	6.00	12.86	13.14*
		(3.27)	(8.71)	(6.31)
	Fragment Declarative	3.50	1.71	0.86
		(2.52)	(2.13)	(1.07)
	Imperative (Total)	22.50	17.43*	18.00
		(7.19)	(9.57)	(7.21)
	+ Imperative	19.50	11.71	12.00
		(7.72)	(6.37)	(5.03)
	- Imperative	0.00	0.57	0.86
			(0.98)	(1.57)
	Imperative + Subject	1.00	4.00	3.71
		(1.15)	(3.46)	(3.35)
	Fragment Imperative	2.00	1.14	1.43
		(1.63)	(1.54)	(2.50)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)

Appendix K: (cont'd) - Means, (Standard Deviation) and significance level of AB versus AN and AF, age-pair 2 (26-32 months).

Adult Speech Parameters		Means (S.D.)		
		AB	AN	AF
Surface Sentence Type	Questions (Total)	26.50 (10.38)	42.00** (14.33)	40.57 (9.43)
	Wh-questions	9.00 (4.76)	9.71 (8.75)	11.43 (6.19)
	Wh-final	1.00 (1.15)	1.14 (2.27)	0.57 (0.98)
	Aux. yes/no	8.00 (5.16)	11.71 (2.93)	10.57 (3.60)
	Raised Verb	1.50 (3.00)	0.86 (1.07)	1.71 (2.43)
	Raised Intonation	2.00 (1.63)	7.71* (2.13)	8.29* (2.69)
	Declarative + Tag	2.00 (1.63)	1.14 (1.07)	1.14 (2.27)
	Tag	0.00	1.14* (1.07)	1.43 (2.23)
	Fragment Questions	3.00 (1.16)	8.57** (2.99)	5.43 (2.99)
Complexity	Present	70.00 (3.65)	65.71 (4.96)	71.43 (10.31)
	Past	5.50 (5.51)	6.86 (5.52)	5.14 (5.52)
	Future	3.00 (8.72)	10.86 (2.54)	10.00 (4.00)
	Verbless Utterances	11.50 (1.00)	16.57* (4.58)	13.43 (6.29)
	Multiproposition	19.50 (11.00	8.00* (6.43)	8.29* (4.54)
	S/node/sentence	1.22 (0.12)	1.10* (0.08)	1.10* (0.05)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)

Appendix K: (cont'd) - Means, (Standard Deviation) and significance level of AB versus AN and AF, age-pair 2 (26- 32 months).

Adult Speech Parameters		Means (S. D.)		
		AB	AN	AF
Discourse Measures	Imitation (Total)	0.00	11.14* (4.14)	5.43* (3.95)
	Imitation	0.00	3.43* (2.99)	1.43 (1.51)
	Transformed Imitation	0.00	7.71** (3.35)	4.00 3.65)
	Correction (Total)	0.00	4.29* (2.43)	6.57** (5.13)
	Syntactic	0.00	1.43 (2.50)	2.00 (2.00)
	Semantic	0.00	2.00 (2.31)	3.14* (2.27)
	Rephrase	0.00	0.86 (1.57)	1.43 (2.25)
	Repetition (Total)	37.00 (11.49)	18.86* (5.40)	35.43 (7.18)
	Repetition	12.50 (9.29)	7.43 (3.60)	14.29 (6.87)
	Transformed Repetition	5.00 (2.00)	5.14 (3.80)	9.71 (5.82)
	Paraphrase	19.50 (11.36)	6.29 (1.80)	11.43 (3.60)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)

Appendix K: Means, (Standard Deviation) and significance level of AB versus AN and AF, age-pair 3 (35-39 months).

Adult Speech Parameters		Means (S.D.)		
		AB	AN	AF
Overall	MLU	7.36 (0.97)	5.14** (0.41)	5.09** (0.34)
	MUT	2.89 (0.86)	2.22* (0.67)	1.55** (0.11)
	Sentence	93.60 (3.85)	82.80** (3.90)	80.40** (4.77)
	Fragment	4.40 (3.85)	8.80* (4.15)	12.80** (4.15)
	Interjection	2.00 (1.41)	8.40* (3.29)	6.80** (2.28)
Surface Sentence Type	Declarative (Total)	51.60 (14.79)	32.40** (14.79)	18.80** (4.15)
	Declarative	41.60 (13.89)	24.40** (14.24)	10.00* (2.00)
	Deictic	6.40 (4.34)	4.80** (4.82)	3.20 (5.22)
	Fragment Declarative	3.60 (3.85)	3.20 (3.90)	5.60* (2.61)
	Imperative (Total)	13.20 (11.37)	13.20 (8.07)	6.40 (5.37)
	+ Imperative	11.60 (9.84)	7.20 (5.02)	5.20 (3.63)
	- Imperative	0.00	0.40 (0.89)	0.00
	Imperative + Subject	0.80 (1.79)	4.40* (4.34)	1.20 (1.79)
	Fragment Imperative	0.80 (1.10)	1.20 (1.01)	0.00

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)

Appendix K: (cont'd) - Means, (Standard Deviation) and significance level of AB versus AN and AF, age-pair 3 (35-39 months).

Adult Speech Paramaters		Means (S.D.)		
		AB	AN	AF
Surface Sentence Type	Questions (Total)	33.20 (5.40)	46.00* (11.05)	68.00** (8.60)
	Wh-questions	17.60 (9.10)	17.60 (5.18)	29.20* (12.93)
	Wh-final	0.00	0.40 (0.89)	0.00
	Aux. yes/no	8.80 (3.90)	13.60* (3.85)	20.40* (6.07)
	Raised Verb	0.40 (0.89)	0.40 (0.89)	0.00
	Raised Intonation	0.40 (0.89)	2.40* (1.67)	2.40 (3.29)
	Declarative + Tag	6.00 (4.00)	4.00 (2.45)	2.80* (1.79)
	Tag	0.00	3.20* (2.28)	6.00 (6.78)
	Fragment Questions	0.00	4.40* (3.58)	7.20** (4.45)
Complexity	Present	82.40 (3.85)	77.60* (5.90)	69.60* (10.53)
	Past	3.60 (4.10)	2.00 (2.00)	6.40 (13.22)
	Future	7.60 (4.56)	3.20* (1.79)	4.40 (5.55)
	Verbless Utterances	6.40 (3.85)	17.20** (3.90)	19.60* (4.77)
	Multiproposition	22.00 (8.25)	11.20 (4.38)	10.80 (4.82)
	S/node/sentence	1.24 (0.09)	1.14 (0.05)	1.14** (0.06)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* p .05 ** p .01 *** p .001 (one-tailed tests)

Appendix K: (cont'd) - Means, (Standard Deviation) and significance level of AB versus AN and AF age-pair 3 (35-39 months).

Adult Speech Parameters		Means (S.D.)		
		AB	AN	AF
Discourse Measures	Imitation (Total)	0.00	4.40* (4.34)	7.20** (3.63)
	Imitation	0.00	2.80* (1.79)	4.40** (1.67)
	Transformed	0.00	1.60 (2.61)	2.80* (2.68)
	Correction (Total)	0.00	5.20 (5.93)	6.80** (3.35)
	Syntactic	0.00	0.00	1.20 (1.79)
	Semantic	0.00	4.00 (4.90)	4.80* (2.28)
	Rephrase	0.00	1.20 (1.79)	0.80 (1.79)
	Repetition (Total)	27.20 (7.56)	17.20* (3.35)	26.80 (7.16)
	Repetition	9.20 (1.79)	3.20** (1.79)	8.00 (3.75)
	Transformed	2.00 (2.45)	8.40* (5.37)	9.60** (3.58)
	Paraphrase	16.00 (7.62)	5.60* (0.89)	9.20 (2.28)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Appendix K: Means, (Standard Deviation) and significance level of AB versus AN and AF, age-pair 5 (66-72 months).

Adult Speech Parameters		Means (S. D.)		
		AB	AN	AF
Overall	MLU	9.56 (0.59)	5.63*** (0.53)	5.80*** (0.80)
	MUT	4.03 (1.43)	2.57* (0.39)	1.84** (0.33)
	Sentence	93.33 (4.27)	73.14** (8.33)	73.29*** (10.16)
	Fragment	3.67 (3.01)	15.86** (6.84)	16.14** (7.80)
	Interjection	3.00 (2.76)	11.00** (2.45)	10.57** (3.69)
Surface Sentence Type	Declarative (Total)	74.33 (8.59)	37.57*** (12.31)	25.86*** (7.76)
	Declarative	50.83 (3.31)	16.86*** (5.46)	13.57*** (5.91)
	Deictic	20.17 (8.82)	10.29** (8.03)	6.57** (3.30)
	Fragment Declarative	3.33 (2.34)	10.43** (3.78)	5.71** (2.93)
	Imperative (Total)	2.00 (2.09)	2.29 (1.38)	1.43 (1.40)
	+ Imperative	2.00 (2.09)	1.29 (1.11)	0.86 (0.69)
	- Imperative	0.00	0.00	0.00
	Imperative + Subject	0.00	1.00* (1.15)	0.57 (1.13)
	Fragment Imperative	0.00	0.00	0.00

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)

Appendix K: (cont'd) - Means, (Standard Deviation) and significance level of AB versus AN and AF age-pair 5 (66-72 months).

Adult Speech Parameters		Means (S.D.)		
		AB	AN	AF
Surface Sentence Type	Questions (Total)	20.50 (9.67)	49.14*** (11.38)	62.14*** (8.51)
	Wh-question	4.33 (4.84)	11.14* (4.14)	15.00** (4.08)
	Wh-final	0.00	0.14 (0.38)	0.43* (0.53)
	Aux. yes/no	6.67 (6.31)	15.14* (6.52)	20.86** (7.43)
	Raised Verb	0.17	0.00	0.00
	Raised Intonation	1.67 (1.51)	6.86** (2.34)	7.43*** (2.44)
	Declarative + Tag	7.33 (2.16)	5.29 (2.36)	4.86 (3.80)
	Tag	0.00	5.14** (3.80)	3.14* (3.18)
	Fragment Questions	0.33 (0.82)	5.43* (4.04)	10.43** (6.73)
Complexity	Present	82.17 (9.02)	60.17* (18.81)	53.71** (18.53)
	Past	8.83 (5.95)	9.71 (10.48)	18.42* (14.97)
	Future	2.67 (2.94)	2.71* (5.19)	1.14 (2.61)
	Verbless Utterances	6.33 (4.76)	26.86** (8.34)	26.71*** (10.16)
	Multiproposition	38.17 (6.33)	9.29*** (2.56)	10.57*** (2.07)
	S/node/sentence	1.41 (0.08)	1.13*** (0.03)	1.15** (0.03)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)

Appendix K: (cont'd) - Means, (Standard Deviation) and significance level of AB versus AN and AF age-pair 5 (66-72 months).

Adult Speech Parameters		Means (S.D.)		
		AB	AN	AF
Discourse Measures	Imitation (Total)	0.00	13.43*** (4.20)	9.00*** (3.16)
	Imitation	0.00	10.86** (4.14)	7.71** (3.04)
	Transformed Imitation	0.00	2.57* (2.82)	1.29** (0.76)
	Correction (Total)	0.00	3.29** (1.98)	7.43** (3.55)
	Syntactic	0.00	0.00	0.29 (0.76)
	Semantic	0.00	1.00 (1.15)	1.43** (0.79)
	Rephrase	0.00	2.29* (1.80)	5.71** (3.20)
	Repetition (Total)	33.33 (4.18)	14.29*** (7.59)	27.00* (15.11)
	Repetition	8.33 (1.97)	3.29** (2.36)	3.29*** (4.42)
	Transformed Repetition	10.50 (3.27)	5.71* (4.61)	13.43 (8.06)
	Paraphrase	14.50 (3.78)	5.29** (4.64)	10.29* (4.57)

Legend: AB = Adult speech type I to children
AN = Adult speech type II to Native
AF = Adult speech type II to Foreigner
* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ (one-tailed tests)